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NEWS IN BRIEF

Delays Frustrate Head Of EFTS Commission

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. – The National Commission on Electronic Funds Transfers has a new set of reporting dates and an office of its own, but Chairman William B. Widnall is frustrated by delays in naming a staff director and getting the commission down to work, he said.

Under a bill signed by President Gerald R. Ford Dec. 31, the reporting dates are now based on October 29, 1975, the date of Widnall's confirmation as chairman [CW, Nov. 19], rather than on the date almost a year earlier when the initial enabling legislation was signed.

The commission, which will study electronic funds transfer systems (EFTS), now has till November to file its interim report, and until a year after that to prepare its final documentation.

In an interview last week, Widnall said he thinks the commission can live with the new schedule.

Selection of a staff director is "just about complete," but there are some "final details to be worked out" before

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Welfare Caseworkers Protest Data Demand

OLYMPIA, Wash. – About 200 of this state's Department of Social and Health Services caseworkers have filed grievances protesting the state's new requirement for extensive personal information on welfare clients.

One caseworker – employed by the state for 15 years – has been fired over the dispute.

The state has told the caseworkers the information is required for clients receiving funds under the Department of Health, Education and Welfare's Title 20 program. State workers say the information required by the forms far exceeds that requested by federal officials.

Ruth Palmer, a caseworker for 15 years, refused to fill out the forms, contending the data would be fed into a computer and she would have no control over what use would be made of the information or who would have access to it after the forms left her hands.

Further, Palmer said, providing the information would violate the confidentiality of the caseworker-client relationship.

In addition, she said, the data coding required on the forms results in a dehumanizing categorization of the facts of

(Continued on Page 2)

For Novice Users

VSPC Makes 370 'More Approachable'

By Don Leavitt
Of the CW Staff

WHITE PLAINS, N.Y. – Strong support for interactive use of large IBM 370s by people who previously considered the machines unapproachable is one of the major design goals of IBM's Virtual Storage Personal Computing (VSPC) program product introduced last week, according to the firm.

VSPC allows multiple concurrent users without heavy DP backgrounds to "borrow" a portion of their company's computer for problem-solving tasks while most of tbe computer is being used for production work by operations or application development work by the professional programming staff, IBM said.

But this new approachability is attained at the cost of an additional layer of control software. VSPC resides in the 370 along with the operating system, access method software and the user's choice of special, separately priced language processors also introduced last week.

Indicative of the overhead impact of VSPC is the fact tbat VS APL, VS Basic and VSPC Fortran can each be used independently with various operating system environments and without VSPC itself.

'Manages the Session'

Primarily, VSPC provides a command language utilizing simple English phrases, which gives the user some processing capabilities, but no real application-level logical facilities. More important, the company said, VSPC "manages the session at the terminal."

This management includes support for accessing, modifying if necessary and then compiling or executing previously stored command strings or programs written in APL, Basic or Fortran.

While these programs may have been written by the users or by their company's DP staff, they might also be selected from a range of programs and functional routines IBM has available for VSPC users.

No matter what the source of the programs, the neophyte user need not understand their internal technical aspects as long as he knows what they require as input and produce as output.

But VSPC also provides an input editor function in support of creation and maintenance of programs from the terminal.

Although it appears to be somewhat akin to IBM's Time-Sharing Option (TSO), VSPC differs from it substantially by not being part of the operating system and by "protecting" the user

The user interface under VSPC is much simpler than under TSO, and in fact changes in the operating system environment should be completely transparent to the VSPC user.

Library Facility

In addition to the command language and the input editor, VSPC is said to include a library facility which enables users to limit access, in varying degrees, to data and programs they have stored.

VSPC also has a conversational remote job entry facility for handling long-running jobs where no user interaction is required.

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Singer Exits From DP Market, Indicates '75 Losses Too Heavy

By Toni Wiseman
Of the CW Staff

NEW YORK – Singer Co. has joined the alumni club of ex-computer manufacturers whose roster has already been swelled by Xerox (1975), RCA (1971) and General Electric (1970).

"The company has decided to withdraw over the next 12 months from the manufacture and sale of its Business Machines Division product line, including retail terminals and data systems," Joseph B. Flavin, chairman of the Singer Co., announced late last month.

"Although the potential of the division is still significant, its continued operations are no longer consistent with Singer's overall aims and financial resources," he said.

Singer, in its financial statement for the year ending Dec. 31, will make provisions of approximately $400 million in expenses and write-downs, including approximately $325 million specifically related to the Singer Business Machines (SBM) division.

By comparison, Xerox's exit from the business was reflected in an $84.4 million charge against second-quarter earnings to cover the loss from discontinuing operations. That firm expects computer operations to show a loss of about $44 million for all of 1975.

In terms of sales, SBM accounted for only 11% of Singer Co.'s total 1974 sales of over $2 billion. In terms of losses, however, the division was a major contributor, according to a company spokesman.

About 400 employees out of a total workforce of 8,900 in the division will be terminated immediately. "These people are being taken care of," according to Robert Lynch, vice-president of corporate information.

Last August a major revamping of the SBM marketing organization resulted in an additional 300 lay-offs.

Singer flew its entire force of sales managers to Dallas last Wednesday and, following a meeting which lasted less than half an hour, terminated all but 14 as of last Friday, according to an industry source.

The software and hardware service forces will, however, remain intact, the source said.

'Practical Economic Decision'

Commenting on Singer's withdrawal from the marketplace, Flavin said "this difficult decision was reached after an extensive review of all of our businesses with the primary objectives of improving our financial base and redefining the future direction of the company.

"Essentially this is a practical economic decision, in view of the substantial losses suffered by the division and the limited availability and high cost of capital," he stated.

(Continued on Page 5)

IBM Victorious in Antitrust Case Filed by Calif. Software House

By Molly Upton
Of the CW Staff

SAN FRANCISCO – IBM is now involved in one less antitrust suit following the dismissal of a case filed against it by Symbolic Control, Inc.

The complaint charged IBM with unfair competition in the numerical control software area and asked for $1.2 million in reimbursement of expenses and an undisclosed amount for profit not realized because of IBM's actions.

District Court Judge Alfonso J. Zirpoli ruled Symbolic Control was not injured in its business or property by any "challenged overt act of IBM" and that its impact claim was not supported by evidence.

Zirpoli awarded IBM costs incurred in the suit.

Symbolic Control, manufacturer of the Automatically Programmed Tools (APT)/70 processor for use with IBM 360/40s and up, filed the action in November 1971, before it had sold or leased a system, according to the court.

The plaintiff first released a production version of APT/70 in January 1971.

Zirpoli ruled Symbolic Control was not harmed by IBM because "without a product for a commercial sale, or at least available for field testing, plaintiff was not 'in the competitive field.' "

IBM had its own production control software system, called NC 360, installed and in use prior to the March 3, 1969 date of Symbolic Control's incorporation.

Zirpoli observed Symbolic Control knew when it was formed that IBM's NC 360 was available free of charge with no restrictions on use or copying and that all versions and modification levels were furnished by IBM free of charge.

When IBM announced unbundling on June 23, 1969, the plaintiff knew "IBM neither could nor would impose a charge on programs already distributed without restriction and in the public domain," the judge said.

He found "the availability of NC 360" and other vendors' APT programs "had

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Prompted by Slaying

Fla. Crime Net Users to Discuss Purging

By Nancy French
Of the CW Staff

TALLAHASSEE, Fla. – Prompted by the recent killing of a man believed to be driving a stolen car, users of this state's criminal justice information system will meet soon to discuss whether stolen vehicles should be purged from the system once their license tags have expired.

Frank Booth, parked by the side of the road, was killed by Trooper Robert Rennie Jr. after Rennie received a radio transmission indicating the auto Booth was driving was stolen [CW, Dec. 10].

The license number on Booth's car matched that of an automobile stolen in 1971, although the color, indicating the year, was different. Since that car had never been recovered, the record was still in the stolen property file.

The trooper, who became suspicious after hearing the report, shot Booth when "he appeared to be reaching for a gun," he explained afterward.

The autopsy report showed the driver was intoxicated, which probably explained why he failed to place his hands on his head when Rennie approached his car and instructed him to do so.

The radio transmission indicating the car was stolen was corrected 27 seconds after the original broadcast, but the correction came too late. Booth was already dead.

Rennie was cleared of all blame by a coroner's jury [CW, Dec. 17], and no action was brought against the dispatcher.

Avoiding Future Mistakes

The users of the criminal justice information system want to assure the system was not to blame and to discuss changes which might help avoid such an occurrence in the future, according to Bob Edwards, director of Florida's Law Enforcement Data Center.

"I want to emphasize that we don't just stick our heads in the sand when something like this happens," Edwards said. "On the other hand, we don't want to act too hastily or deprive police officers of information they need to make decisions on the job."

Edwards, who refused to point the finger of blame at the system or any individual involved in the Booth slaying, explained "the system provides the information and it's up to the law enforcement officer to read and evaluate the messages that come out.

When asked whether the incident could have been prevented if the trooper had waited for the registration check to be completed, Edwards refused to comment.

The Florida Crime Information Center's (FCIC) computer system, like those of nearly every other state, contains many old records, law enforcement officials said, and National Crime Information Center (NCIC) guidelines encourage this.

NCIC record validation procedures specify that files be dumped every four months, and at that time each law enforcement agency is sent a copy of the files it input.

If the records contain errors or omissions, the agency which input the data gets an opportunity to correct the record. Only the agency that entered the original record may update or change that record under the present system.

However, NCIC guidelines permit wanted persons and stolen articles to remain on file as long as five years. If a record is deleted at the end of the five years, the originating agency may input it again, and it becomes valid for another five years, Edwards said, noting it is this policy that will be discussed.

VSPC Aimed at Untrained Users

(Continued from Page 1)

This facility can help increase programmers' productivity, since they can use it "to develop and maintain programs written in any language supported by the virtual system control program," a spokesman added.

This aspect of VSPC's capabilities is apparently not limited to the interactive languages, but can be applied as well to batch-oriented ones such as Cobol.

Professional programmers, then, are able to retrieve virtually any program they have stored on a source statement library.

VSPC permits the manager of a computer facility to control the use of the system's resources and to maintain security. The manager can, for example, allocate the amount of central processor time and the amount of library data storage space available to VSPC users.

ID codes and password assignments are available for security, IBM noted.

The support facility can be used with 370 models 135 through 168, IBM said. Though no storage minimum was cited with those CPUs, the company noted that models 115 and 125 with a main memory of 256K characters "can support a limited number of terminals for trial purposes."

Shipment of VSPC is scheduled to begin in the second quarter for use with OS/VS1, in the third quarter for OS/VS2 (MVS) and in the fourth quarter for DOS/VS. VSPC will be available under license for monthly fees ranging from $900 to $1,200.

Shipments of the language processors are also scheduled to start in the second quarter. These program products will also be under license for monthly fees of $400 each for either VS APL or VSPC Fortran and $385 for VS Basic.

Application software for use with VSPC includes Business Analysis/Basic, Math/Basic and Stat/Basic, which are all program products supported by IBM.

Under APL, Minipert – also a program product – and Graphs and Histograms, Graphpak, APL coordinate geometry and zero and integer support under APL – all Field-Developed Programs – can be supplemented with a number of Installed User Programs, IBM said. Prices were not immediately available on these packages.

Any standard Fortran programs can be used with VSPC Fortran.

Caseworkers Protest Data Requirements

(Continued from Page 1)

an individual case.

Finally, filling out the forms imposes a heavy paperwork load on caseworker and takes time away from their work with welfare clients, she said.

"In one case, 94 pieces of paper had to be filled out to provide services for a woman and her four children," Palmer recalled.

The protesting caseworkers are members of the state subunit of the American Federation of State, County and Municipal Employees, which is also affiliated with the American Federation of Labor-Congress of Industrial Organization.

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Singer Exit Could Swell Justice Docket in U.S. vs. IBM

By Edith Holmes
Of the CW Staff

NEW YORK – With the exit of Singer Corp. from the business of making and marketing computer systems, the Department of Justice anticipates it will have still another source of witnesses to bring before the court in its antitrust suit against IBM.

Counsel for the government and the corporation plan to conduct extensive discovery of Singer's files and personnel in an effort to determine the reason for the firm's withdrawal from the computer industry.

Should any of these reasons be applicable to its market definition case, the Department of Justice will certainly call witnesses from Singer to testify before the U.S. District Court judge trying the case here.

The government has followed this procedure once before – Xerox's exit from the system business during the summer provided Department of Justice attorneys with a recent instance of a company potentially "forced out" of the market due to the sheer size, if not the actions, of the industry leader.

A sizable chunk of the government's case already revolves around the exits of General Electric Co. (GE) and RCA in 1970 and 1971 respectively and any connections these withdrawals might have with IBM's presence in the marketplace.

Three Xerox witnesses have been added to the government's list thus far. They include Wallace B. Askins, deputy corporate controller and financial officer of Xerox Corp.; Rigdon Currie, director of special business of Xerox Corp.; and Harvey Cohen, former vice-president for marketing for Xerox Corp.'s Data Systems Division.

The lead government attorney, Raymond M. Carlson, said in court last week his staff is interviewing seven or eight more people at Xerox as potential witnesses.

The Department of Justice team will know which of these people will be asked to appear in court by mid-January.

Ideally, the Xerox and Singer witnesses will follow the already completed GE story and the story and the description of RCA's computer experience currently being detailed in court.

Four more RCA witnesses remain to take the stand, however, and at the trial's average pace of one witness a week, the government is not likely to complete the testimony of these witnesses by the scheduled end-of-January date.

Even if the RCA portion of the government's market definition case is completed by then, IBM counsel will need time to take the depositions of these additional witnesses.

Accordingly, the court has agreed to take a recess during the second week in February to accommodate the lawyers for the defense if necessary.

Saturday court sessions are also likely.

For its part, IBM will seek to show with the Xerox and Singer witnesses what it has succeeded in drawing out of the GE and RCA witnesses who have testified thus far: that mistakes made by each of these firms lie at the root of their separate demises, rather than the presence and actions of IBM.

In the meantime, the government is experiencing some difficulty with a few of the witnesses already on its list.

Frederick Withington of Arthur D. Little, Inc. and Felix Kaufman of Coopers & Lybrand, scheduled to appear as expert witnesses on behalf of the U.S., have asked Judge David N. Edelstein to quash the subpoenaes requiring them to take the stand.

Withington and Kaufman argued that, as unwilling experts, they cannot be compelled to testify. "Until now, Coopers & Lybrand had assumed that its accounting expertise was its own professional stock in trade to be dispensed as it sees fit," attorneys for Kaufman said.

"The court's opinions raised for Coopers & Lybrand and numerous other professionals the proposition that their expertise can be commandeered whenever the government or, indeed, some private litigant can convince a court that an important question is involved."

An expert must testify voluntarily and be paid for his service, they contended.

Both the government and the judge, however, maintained it is well within the federal court's power to require experts to appear in a case.

Edelstein has denied Withington's and Kaufman's original motions and their recent joint application to appeal.

Head of EFTS Group Frustrated by Delays

(Continued from Page 1)

the choice can be announced. There is still some question as to how the director is supposed to be named to his post, he added.

The process of seeking an interpretation on this point has been just one more of the things that have created "a hell of a drag on getting things going," the chairman added.

Although he had expected to delay calling the commission into session until after the staff director had been confirmed, Widnall now feels he may call a meeting even before a nominee is considered by the Senate. "I want to get going. I'm very impatient with the whole thing."

In anticipation of getting down to work in the near future, he said he "certainly would be interested" in hearing from volunteers who would be willing to work on the various technically oriented task groups the commission is likely to spawn.

Requests for information and names of volunteers should be sent to Widnall at the commission office, Suite 900, 100 Connecticut Ave., here in Washington, D.C. 20036.

IBM Victor in Suit

(Continued from Page 1)

no adverse effect on" Symbolic Control since it "planned to develop APT/70 to replace NC 360 and other APT programs.

"None of the potential customers that examined APT/70 declined to lease the product as a result of any act or conduct of IBM," including free maintenance of NC 360, the court found.

Ralph Wanger Jr., chairman of what he called "an inactive Symbolic Control," reportedly said his attorneys will ask for another hearing.

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Singer Users, Shocked at First, Now Seem Indifferent

By Toni Wiseman
Of the CW Staff

When Singer announced it was exiting from the computer market late last month, reaction of users was one of shock more than anything else, according to a *Computerworld* survey. But now, two weeks later, there seems to be an air of virtual indifference.

Wentworth Tire of Chicago has had a System Ten for about a year and has been running on it only four months.

"I was surprised and shocked by the news," Bud Freeley; Wentworth's DP manager, recalled, "but I don't intend to change to a different vendor. Even if I did, I don't know where I'd get rid of the equipment."

Freeley doesn't feel he is really facing any major problems because his software is provided by an independent firm and Singer has promised hardware support for at least five years.

"But if the support starts to break down, then I'll begin to get upset," he said.

Jan Huffman, controller at SDK Co. in Boston, was "very upset" when he read about the withdrawal in the *Wall Street Journal*, particularly since he had not received any notification from Singer.

In fact, when he contacted his service representative, "he didn't know about it either, but said that it doesn't affect Cogar equipment," which is marketed by Singer.

Huffman finally received his notification letter nine days after the Singer announcement.

"We're very unhappy about the turn of events," Huffman said, "since we feel [Singer's] equipment fills a unique slot which no other manufacturer is able to fill right now."

SDK will not, however, be keeping its numerous 1501s, which are on 30-day rental, but will replace them, probably with IBM data entry equipment.

Several other users who did not wish to comment at length on the situation said they weren't really worried, either because they had already planned to phase out the Singer equipment within the next couple of years or because they felt that support in the coming years would be adequate.

No Panic

People aren't going to dump their equipment in panic, according to Sam Glickman, sales manager for System 10 Programming, a Chicago software firm which specializes in Singer equipment.

"There are two categories of users. First you have the users who have been using Singer Tens since late 1970, early '71. Those machines have just hit their fifth birthday," he said.

"Five years down the line they'll be 10 years old and that is probably outside the normal amortization and depreciation rate for the user, so there isn't an economic loss situation apparent for the older user.

"The newer user, who just put a system up last month or the month before, may be slightly short and I think there may be some attempt by them to gain the additional two to three years they need to fully amortize the equipment for tax purposes," he said.

Tony Scherzer, president of System 10 Programming was not worried about the future of the company either, although he is drawing up a "number of contingency plans based on what happens over the next three to six months.

"We could look for a different vendor's equipment to support, or we could give users crossover support should they decide to pick up and move," he said.

"But we're not jumping around looking for other machines for the basic reason that Singer's position in the marketplace, the machine itself, is rather unique. It's really the only one that works well in real-time at that kind of price level."

Singer Losses Cited In Decision to Exit

(Continued from Page 1)

While noting Singer has achieved a major market position in the U.S. point-of-sale (POS) sector and considerable penetration in the international systems market, Flavin said "the company is not able to fund the future development and growth of the Business Machines Division and still provide adequate capital for the company's fundamental businesses, which possess basic and long-term strength in addition to near-term profit potential."

Ready to Sell

Singer Co. is now actively pursuing the sale of the division. "Despite what the various press media have said," this is the first time Singer has tried to sell the division, Lynch said.

Singer would like to sell the division as a whole, he stated, but noted there could be parts of SBM that might be more attractive to some people and could be split off, such as the POS or Cogar operations.

"We contacted the organizations we thought would have an interest in buying and that was a fairly large number," Lynch said. "We have already started to get responses from them and in some cases there was interest.

"The fact that we got responses even over the holidays was encouraging," he added.

Singer customers were notified of the company's decision in a letter which went out Dec. 29 over the signatures of George Cogar, SBM president. The letter contained a "hot line" number which users could call for further information.

The text assured customers the company intends to supply hardware and software maintenance over the next five years and, in the eventuality of a sale, would insist on complete service from the purchaser.

After the five-year maintenance period expires, Singer could conceivably sell the service organization. "All sorts of options are open and we still don't know which one will come about," Lynch said.

All equipment presently on order will be delivered, Lynch noted, and Singer will continue to accept orders for off-the-shelf equipment through mid-1976.

If order volume up to that point warrants it, the company will continue manufacturing activities to fill the orders, he said.

Customers with equipment presently on order who, as a result of Singer's decision to withdraw from the market, wish to cancel their orders will each be treated as an individual case, Lynch said.

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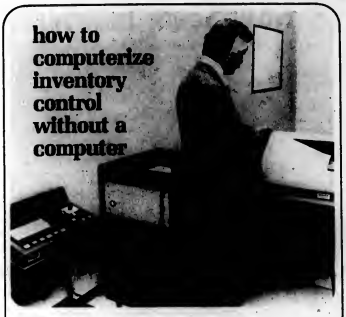

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Pennsylvania Bureau of Elections Automating Candidate Processing

By Nancy French
Of the CW Staff

HARRISBURG, Pa. – The state Bureau of Elections here will operate the first computerized system in the nation for processing nominating petitions and papers filed by candidates seeking public office in the state this year.

The objective of the system is to make available without delay to members of the press, the candidates themselves and Bureau of Elections officials the most current data on about 5,000 candidates expected to run for office.

The automated system, which Department of State Secretary C. Delores Tucker described as "consumer-geared" has been designed to "virtually eliminate delays in processing and obtaining all vital information on every candidate, his or her petitions and current status in fulfilling filing requirements."

Massive Paperwork

The 1976 elections promise to produce a massive amount of paperwork, a spokeswoman explained.

The state's 100-odd U.S. congressmen, one of its U.S. senators and its entire State House are up for reelection this year.

In addition, the state will hold a presidential primary. Finally, every delegate to the political parties' conventions will file a petition and be elected to serve, so estimating that 5,000 various candidates will file for some office is not at all out of line," the spokeswoman said.

To run for office, each candidate must file a petition indicating he meets the qualifications for the position. This must be accompanied by a filing fee and a list of signatures supporting his candidacy.

In the past, these petitions were recorded manually – a very time-consuming job, the spokeswoman said.

The automated system, which will be maintained on the state's Higher Educational Assistance Agency's IBM 370/145 here, will contain the name, occupation, home address, electoral district and county residence of every prospective candidate as soon as he files.

It will also record court challenges of candidates, candidate withdrawals, ballot certification, substitutions on the ballot and primary and general election returns.

It will provide data such as statistics on the number of filings by party, the number of independents who have filed, figures on incumbents vs. challengers, a breakdown of candidates by occupation and the number of withdrawals or petitions rejected, according to Tucker.

Data will be entered on IBM 3270 CRTs.

Firm's DP Center Open to Class

ISHPEMING, Mich. – When the adult-education class here on Introduction to Data Processing runs its programs, it goes to the Cleveland Cliffs Iron Co. to punch cards and feed them to an IBM 370/135.

The students have the use of the DP center at the firm here on Sunday mornings through the courtesy of the company, which is the major employer in town.

Instructor Rob Heidrich is a programmer analyst at Cleveland Cliffs and supervises the procedures.

The students use the card reader and get to see initial program load (IPL) and all the other chores that go with operating a data center, he said, since the center is not running Sundays.

The accredited course is offered through the Community Education Division and has students who are taking it for enrichment as well as those enrolled for credit for a high school diploma, he said.

The one-semester, one-night-a-week course is "more of a survey"-type course, but, by the time they are through, students have written about four PL/1 programs, he said.

The course is open to residents of Ishpeming and two other towns in the area, he said. Usually there are 20 students who enroll and about 12 who finish. "Many initially think it is a keypunch instruction class," he said, but find out otherwise when they see there's a textbook and assignments.

Heidrich has given thought to teaching a more advanced class, but there are not enough people to justify it, he said.

Although in each class there are three or four who would like to continue, they are either gone or have lost interest two years later when there might be enough interested veterans of the introductory course to make a class, he said.

Heidrich said he started the course after becoming interested in audit education.

The course has run about five different semesters, he said.

Cleveland Cliffs also makes available time on its 370/135 to run Fortran programs in a batch mode for an advanced class at the local high school.

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'Tracs' Keeps Track of Canadian Rail Freight Cars

By T.M. Whiteman

Special to Computerworld

MONTREAL – The recently commissioned computer-based information system of Canadian National Railway (CN) is expected to have as major an impact on railroad operations as the swtich from steam to diesel did a quarter of a century ago.

"We now have a tool, for the first time since railways began, which enables us to assign a destination to every empty car as soon as it is unloaded or is received from another railway," W.G. Piggott, the railroad's vice-president of operations, said.

CN's $55 million Traffic Reporting and Control System (Tracs) took five years to implement.

"The Tracs program represents a long-term capital value saving to us of $100 million through improved car utilization and millions of dollars annually in increased earning power," Piggott said.

The information system, based on two IBM 370/165s, keeps track of 120,000 freight cars, 2,500 locomotives, 3,000 piggyback trailers and 20,000 domestic and foreign containers every minute they are on CN lines in Canada.

"More important though, it gives back information in manageable form on the 300,000 things that change every day in the operation of the railroad," Piggott added.

Massive Network

The Tracs system is essentially a massive computer/communications network based on the two 165s. Main computer operating memory is 2M characters, and disk file storage memory is 3G characters.

The network has 206 field I/O locations with some 525 I/O machines and is linked with 85 carload centers across the country. To tie it all together, the railroad relies on 300,000 telecommunications circuits, of which 370 are dedicated circuits.

With some 120,000 freight cars on the line, the railroad relies on Tracs to handle 40,000 car billings per week. The equivalent daily punch card volume would be 300,000 cards.

Daily management and customer inquiries being handled run as high as 12,000.

While the system cost some $55 million to implement, its annual operating cost is about $12 million, according to CN. But the estimated savings over the previous way of doing things is $18,000, CN said.

Among the benefits to the railroad are increased productivity from its freight-car fleet and better service to its customers.

Computer files are constantly updated to provide information for marketing and accounting documentation, empty-car management, motive power control, terminal control systems and the railroad's car-movement control system.

While all are of value in improving performance and service, the documentation and empty-car management aspects of the system are of direct interest and benefit to shippers.

Code Number Used

About 1.6 million carload shipments, or about 80% of the railroad's annual carload traffic, recur at least three times a year. As part of the Tracs system, each one is identified by a customer code number.

That number, the shipment's repetitive waybill code, allows the railroad to retrieve from the computer all of the pertinent data to move the traffic when the variable information, such as car number and weight, are added.

The system's equipment simultaneously prepares a complete tape record for transmission to the central computer and transmits a copy of the waybill to the proper accounting center for customer billing.

A special feature is that customers in the U.S. and Canada can inquire by Telex directly to the Tracs computer about where their carload freight is at that time. Customers can call the nearest carload center toll free for the information.

First field implementation of the Tracs system took place early this year in Nova Scotia, with further implementation through 14 of the railroad districts until final integration of the West Coast area.

As the system's implementation went westward, special billing and accounting systems already established for potash and grain shipments were integrated.

Hundreds of field terminals, such as the one shown above, are in use on Tracs.

GAO Studying Use Of Intelligence Funds

WASHINGTON, D.C. – The General Accounting Office (GAO) is surveying 10 large-city police departments to determine how each is using federal funds to gather intelligence on criminal activity.

Cities being studied include: Washington, D.C.; New York; Chicago; Dallas; Detroit; Los Angeles; Philadelphia; Baltimore; Cleveland; and Houston.

The inquiry was requested by the Senate Permanent Subcommittee on Investigations, and the report is expected to be released soon.

CLA Sets One-Day Program In March on DP Contracts

WASHINGTON, D.C. – A full-day program on computer contracts will be sponsored March 3 by the Computer Law Association (CLA) here.

Cost will be $10 for members of CLA and $15 for nonmembers, which includes lunch. For further information, contact Edward Grenier, Suite 800, 1666 K St. N.W., 20006.

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Fears Bill Would Lower Response

Census Bureau Opposes 75-Year Confidentiality Limit

By a CW Staff Writer

WASHINGTON, D.C. – Census officials have launched a campaign to kill a bill that would open census reports to the public after 75 years. They fear reports of government misuse of personal information will have an adverse impact on the public's willingness to provide confidential information for the 1980 census.

Their efforts are being opposed by historians, archivists and genealogists who say they need old census data for research purposes.

In hearings before the House Subcommittee on Census and Population, Census Bureau Director Vincent P. Barabba testified against setting any time limit to the privacy assurances given by census takers.

The "risks" of weakening the pledge of confidentiality "are too great," he said, adding, "in its simplest form, a promise is a promise."

'Gentlemen's Agreement'

If passed, the bill, H.R. 10686, would formalize a 1952 "gentlemen's agreement" between the Census Bureau and the National Archives that calls for release of census returns after 72 years.

Although the Census Bureau has since tried to annul the agreement, it was upheld by the Justice Department, and the 1900 census was recently opened to researchers.

The 1890 census records were destroyed by fire, and earlier census data, for which confidentiality was not pledged, have long been public information, a Census Bureau spokesman said.

Information collected for the Census Bureau's 100% poll includes information such as name, birthdate, marital status, race and sex of each family member as well as each one's relationship to the head of the household.

Further, it includes housing information such as whether the home has a telephone, basement, flush toilet, hot and cold piped water and bath or shower. It also specifies whether those facilities are used exclusively by family members or shared with another household.

The bureau's 20% sample contains income questions, a spokeswoman said.

Processed by Computer

Since the introduction of Univac I by Jay Eckert and John Mauchly in 1951, all census data has been processed by computer. The Census Bureau still uses Univac equipment, but today's models are 1107s and 1108s, according to a Census Bureau spokeswoman.

Mark sense reader forms prepared by individuals are organized geographically and microfilmed. These film records, which contain name and address of the respondents, are then transferred to magnetic tape by a film optical scanning device for input to computers (fosdic) which read only the marks.

During this process, name and address data are essentially expunged, she explained.

The raw data is then processed and statistical information is printed out and published.

The issue of access versus privacy has been exacerbated by growing concern over the integrity of official information about private citizens once it reaches the government's hands, a critic said.

Concern over census records pits two legitimate but competing needs of society against one another, a spokesman said.

The bill to set a 75-year limit was introduced by Rep. Paul Simon (D-Ill.) who is said to have used 19th-Century census data for historical writings. The bill is supported by the Church of Jesus Christ of Latter-Day Saints, which maintains genealogical records for religious purposes.

It is understood to have the backing of Carl Albert, Speaker of the House, himself an amateur genealogist.

Confidentiality Breached

Confidentiality was breached during World War I when census data was used to prosecute men who tried to evade the draft on grounds of age.

During World War II, the Census Bureau was asked to produce complete lists of West Coast Japanese-Americans for incarceration, but officials refused.

In 1970, census forms stated, "your answers are CONFIDENTIAL . . . [and] will be used only for statistical purposes and cannot, by law, be disclosed to any persons outside the Census Bureau for any reason whatsoever," according to Barabba's testimony.

Americans may have to be told that information they provide would ultimately be released, Barabba said. "We don't know what adverse impact this kind of statement would have on response rates," he said.

Rep. Gunn McKay (D-Utah) disagreed with Barabba, arguing "the real issue should not be strict confidentiality, but rather how to allow access without harming the enumerated."

The main obstacle of data collection was not fear of disclosure, but rather "a general suspicion of the government or of any stranger at the door in crime-ridden areas," he said.

Jury 'Weighs' Data, Decides Against DP Diet Promoter

NEWARK, N.J. – A jury here has convicted Jack Fried on charges of advertising and selling phony computerized diets through the mail.

"Medical doctors and psychographologists working with the aid of the new Microscannor computer to analyze your handwriting can determine the type of formula best suited to you for losing weight," a Fried direct-mail ad stated.

While the concept is intriguing, unfortunately the computer and the psychographologists existed only on paper, and most of the diets mailed out were very similar to one another, according to U.S. Attorney Jonathan L. Goldstein.

Fried faces penalties of five years in prison and a $1,000 fine on each of 18 counts of mail fraud.

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Vendor, School Join to Keep Ghetto Youths 'Running'

NORTHRIDGE, Calif. – Many ghetto youths are now running programs at a computer center here instead of running in the streets.

The Ujima Educational Computer Center (Ujima is a Swahili word meaning collective work and responsibility) is a community-based center supported by California State University at Northridge (CSUN) and Honeywell Information Systems (HIS).

The concept of Ujima grew from the ideas of Keith Bass and Keith Mitchell, faculty members of the Office of Special Programs at CSUN. The program was designed to provide a vehicle which would enhance the opportunity for ghetto youth to enter the professional end of DP, an area where blacks and other minorities are very poorly represented, according to Bass.

The idea began to take shape in 1972 when the State of California decided to phase out CSUN's second-generation Honeywell G255 system. The state was approached with the idea of donating the system to a community-based project, and, after a couple of months of review, it was satisfied the Ujima project had the proper sponsorship as well as a sound plan for maintaining the equipment, Mitchell said.

This sponsorship was provided by HIS, whose participation included removal of the system from the university site, refurbishment and installation at the community project site, training of Ujima staff and a maintenance plan.

The maintenance plan stipulated HIS would maintain the system until the Ujima staff could take it over. The system has, for the last year, been maintained completely in-house, Bass noted.

The Ujima center is financed by a small grant from CSUN, which covers only rent and electricity, but the university also staffs the center by giving release time to faculty members from the Office of Special Programs.

"Dave Fabian, director of personnel for Honeywell's Western Operations, has been coordinating support from HIS and has been instrumental in solutions to our problems," Bass said. All other support comes from donations.

Major Difference

Students participating in the project are taught the academic side of DP. The major difference between the Ujima center and other ghetto DP programs is that at Ujima the computer is being used to expose the youth to the practical aspects of math and to show them what the technical fields have to offer, rather than stressing "fast preparation" for vocational careers, Mitchell explained.

The open-shop structure helps to remove the students' fear of computers, he added. Prior to their participation in the program, many students felt computers' only function was printing bills and welfare checks. Students leave the project with much greater insight into the use of computers, he added.

Students from surrounding junior and senior high schools participate in the project. Classes meet at the center – located in a converted "5 & 10" store – five days a week. The program is worked out with the cooperation of the Los Angeles city school system, and students receive credit for the courses.

The future of the Ujima Educational Computer Center looks bright because it has continuing support from the university as well as private industry, Bass and Mitchell said. The center will soon be receiving an HIS 1640 Timesharing System.

Parisians Compiling Data Base to Help Planners

By E. Drake Lundell Jr.
Of the CW Staff

PARIS – An integrated data base containing all of the information available about this city will soon be used to permit planners to simulate the probable results of proposed programs.

To date, however, the efforts of the planners of the municipal data bank have been devoted to collecting as much material as possible about the city and its inhabitants, according to J.L. Subileau, deputy manager of the Atelier Parisien d'Urbanisme (Apur) here.

When the organization was established in 1967, he said, there was a lack of statistical information available about the city. What was available was spread among many organizations and was not coordinated at all.

The system then was used in the sphere of real-estate planning, but could only give very gross criteria that, he admitted, did not always reflect the reality of the situation.

Since then the organization has been working to standardize and consolidate all of the available data, but this has generally been hard because the planning agency has to rely on other organizations for data and does not do its own data collection.

During this time Apur has tried to operate by pragmatic testing and not just theory, he said, checking to see the data supplied really reflected the situation.

Divided Into 500 Areas

In order to get the fine detail needed for town planning and for simulations of the future, Apur has divided the city into 500 areas by population. Each area contains about 4,600 people since the city has a total population of approximately 2.3 million.

Paris needs to stablilize its population, Subileau indicated, since it presently is subject to rapid shifts in population from one area to another.

To do this, the planning model will have to be used to help project the effects building in certain areas will have on the population not only in that area, but also in adjacent parts of the city.

Clearly in certain areas building will have to be encouraged while in others it will have to be banned, Subileau said.

One of the more innovative programs under way at Apur is a simulation of architects' plans to project the aesthetic effect of their designs on the area around the proposed building.

The program is voluntary now, Subileau said, but has been well accepted by architects since they learned to use it.

Presently the system only provides a black-and-white line drawing showing what the proposed building looks like from various perspectives, but the planners would like to add a color capability at a later date.

However, to make such a system really effective the planners will have to collect a lot more data on the city than is presently available, Subileau noted. New data on such things as the colors of buildings and the sightlines from point to point will be needed, he said.

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DAY I – MONDAY, FEBRUARY 16

*9:30 - 12:30	*Applications; Manufacturing*
*9:30 - 12:30	*Applications; Service Industries*
*9:30 - 12:30	*Networks; Networking Revisited— Effect of New Facilities and Procedures*
*9:30 - 12:30	*Forum; Network Diagnostics*
*9:30 - 12:30	*Applications; Insurance*
10:00 - 11:30	*Workshop; Network Planning & Budgeting*
10:30 - 12:00	*Workshop; CPU's and DataComm Software*
*2:30 - 5:00	*Basics; System Planning & Administration*
*2:45 - 5:30	*Networks; Network Optimizing Techniques*
R3:00 - 4:30	*Workshop; Network Planning & Budgeting*
R3:00 - 4:30	*Workshop; CPU's and DataComm Software*
3:00 - 4:30	*Workshop; Communications Processors and Multiplexers*

** Signifies sessions with 30 minute break for reviewing exhibits and for refreshments*
R Signifies Repeat Sessions

DAY II – TUESDAY, FEBRUARY 17

R8:30 - 10:00	*Workshop; Communications Processors & Multiplexers*
*8:30 - 12:00	*Networks; Optimizing International Networks*
8:30 - 12:00	*Forum; Bringing DP Power Closer to the User — Role of Terminals*
*8:45 - 12:00	*Applications; Government*
*8:45 - 12:00	*Applications; Banking & Securities*
*8:45 - 12:00	*Applications; Energy Industries*
*9:00 - 11:30	*Basics; Data Transmission Services & Modems*
10:00 - 11:30	*Workshop; Network Implementation*
10:30 - 12:30	*Workshop; Remote-Batch and Data-Entry Terminals*
*2:30 - 5:00	*Basics; Data Terminals*
*2:45 - 5:30	*Networks; Minis in Distributed Networks*
*2:45 - 5:30	*Forum; Bringing DP Power Closer to the User — Role of Small Business Computers*
R3:00 - 4:30	*Workshop; Remote-Batch and Data-Entry Terminals*
3:00 - 4:30	*Workshop; Interactive CRT and Hard-Copy Terminals*
R3:00 - 4:30	*Workshop; Network Implementation*

** Signifies sessions with 30 minute break for reviewing exhibits and for refreshments*
R Signifies Repeat Sessions

DAY III – WEDNESDAY, FEBRUARY 18

R8:30 - 10:00	*Workshop; Interactive CRT & Hard-Copy Terminals*
8:30 - 10:00	*Workshop; Modems & Couplers*
*8:45 - 12:00	*Applications; Hospitals and Health Care*
*8:45 - 12:00	*Applications; Computer Services*
*8:45 - 12:00	*Applications; Retailing/Wholesaling & Distribution*
*8:45 - 12:00	*Networks; Optimizing Data Entry in Distributed Networks*
*8:45 - 12:00	*Forum; Rap Session on Distributed Networks*
*9:00 - 11:30	*Basics; Data Processors & Software*
10:00 - 11:30	*Workshop; Network Management*
R10:30 - 12:00	*Workshop; Modems & Couplers*
10:30 - 12:00	*Workshop; Data Transmission Services*
1:30 - 3:30	*Networks; Role of Remote-Batch Terminals in Distributed Networks*
R2:00 - 3:30	*Workshop; Data Transmission Services*
R2:00 - 3:30	*Workshop; Network Management*

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31	Banking
32	Insurance
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	Government
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From Printing to Validating

System Handling Massachusetts Lottery Covers All Bets

By Ann Dooley
Of the CW Staff

BOSTON – One man calls from Hawaii every week to find out if he's a winner. Another threw a $1,000 party only to discover his $50,000 winning number was for the week before.

Such examples of game fever are commonplace to Jerry Katz, DP coordinator of the Massachusetts Lottery Commission.

Computers are involved in nearly every aspect of the lottery, Katz said. The system generates the random numbers that go on the tickets as well as a new random number type for each pool of one million numbers used.

The computer system also prints the tickets, takes care of distribution and validates the claims. All the programs are written by the lottery commission's staff.

"We started out with an IBM 360/40 but changed to a 370/135 using 3340 disks and 3420 tape drives," Katz said. "We're using 84% of utilization and the claim is only for 80%.

"Of course, we wear out a printer every 12 months doing it," he added.

The commission has its own computer system to develop games and has helped to develop others, such as for the Maryland lottery. The staff consists of seven people on the DP staff, eight in the computer room and 10 data entry people, Katz said.

The lottery started out with a six-digit game, but "if you don't change it, sales start to drop," Katz said. In order to keep up interest for the regular weekly lottery, additional games are run.

These games, run on a short-term basis, are often seasonal, like the Santa Claus game or the Spring Fever game. Others, such as the Yankee Doodle game, have gimmicks of some kind.

In the Yankee Doodle game the buyer got a sealed pouch with two halves of a ticket. "If the two halves matched you were a winner, but for us the validation of the matches was a real DP headache," Katz said.

A complete new program for a daily game had to be devised every 13 weeks to ensure interest and fairness, Katz said.

The instant game was required by law to distribute 45% in prizes, so stringent control in programming occurred in order to get that amount, Katz said. Eight million tickets were sold in the first few days before they ran out.

Game in the Works

A game is being planned which will involve better slips, microfilm and scanning. An off-line system has been chosen for it.

"It will double the computer capacity, but will probably return back to the cities and towns $400 million instead of $40 million," Katz said. Last year, the state-owned lottery turned back $6.8 million to the city of Boston.

"We have little downtime because the 135 is a reliable machine," Katz said. "We also have the tickets in advance so that a few days' downtime wouldn't kill us.

"We have three printers – two for tickets and the other for batch work. We use DOS/VS and CICS and were one of the first to go to them," Katz said.

"We're also bringing in a 125 for a second mainframe," he added.

The lottery is fixed by law to have a 15% overhead, Katz noted. There are 4,500 agents who are able to play the lottery.

The lottery is now offering telephone betting in which a person gives an account number and a password which is handled by on-line programming. "The lottery is competitive with the bookies – we offer 600:1 odds," Katz said.

"A big problem for us is people who don't collect their winnings," Katz said. Last year $2 million went unclaimed.

DP Executives' Wages Rise in 1974-1975

LAKE BLUFF, Ill. – Salaries of DP executives rose in 1974-1975 along with the complexity and importance of their jobs, according to a survey by A.S. Hansen, Inc.

DP salaries in general stayed even with the rate of inflation during the year ending in June, the 1975 "Weber Salary Survey on Data Processing in the U.S." indicated.

"DP employees fared about as well as other industry employees during the past year," Robert Greene, a compensation consultant with Hansen, explained.

Top management averaged a 10.3% salary increase, systems analysts averaged an 11.3% rise and programmers' salaries rose 11%.

Computer operators and keypunchers came in at the low end of the scale with increases of 6.3% and 7.6% respectively, according to the survey.

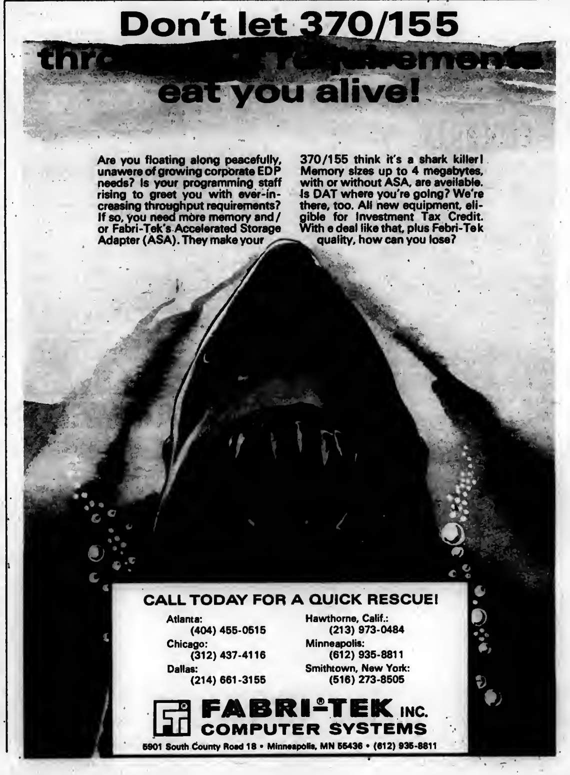
The report increases differed with the findings of a survey done by Robert Half Personnel Agencies, Inc. [CW, Sept. 3]. The Half survey indicated a much smaller rise in salary overall and no change in the operator and keypunch jobs.

The Half survey was concerned with hiring rates while the Weber survey dealt with the current wages, Greene explained.

Top management averaged an annual salary of $29,588 this past June compared with $19,760 in June of 1970. Because the typical installation is becoming larger and more centralized, Greene said, the status of the top executive is also increasing.

The Weber survey contained data on more than 1,000 companies and 84,087 employees, with information from 67 cities, 10 types of industries and five sizes of DP installations. The executive salary on a national level varied from city to city while the keypunch salaries stayed the same across the country, according to Greene.

Greene said it was difficult "to split out what the recession had to do with the results." While the recession might have deferred new systems or put a freeze on expansion, no salaries had been withheld because of it, he said.



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High Costs of CAI Hindering Progress

The cost of computer-aided instruction (CAI) is diminishing at a disappointingly slow rate, as shown by figures cited at the recent conference on computers in education held by the International Federation for Information Processing in Marseilles, France.

J. Daniel Couger On Education

The autumn conference attracted almost 1,000 persons from more than 50 countries. Virtually every academic discipline was represented and more than 300 papers were presented. Despite the heterogeneity of disciplines, a uniform interest emerged. The progress and problems of CAI were foremost among discussions both in and out of the formal sessions.

Traditional Goal

The traditional goal of developers of CAI systems is 50 cents per student contact hour for increased learning effectiveness through greater control and prompt reinforcement. Also, the huge development cost is expected to be offset by improved teacher productivity.

The premise is that a computer-based teaching system provides a "tireless" instructor capable of serving a large number of students for many hours per day and capable of dealing with both the redundant aspects of drill and practice and the unique requirements of individuals with infinite patience.

Harvard's Jack Austin revealed results on research on costs of CAI. Austin is a member of a team performing CAI cost evaluation for the Educational Testing Service. The team will produce a detailed report this year.

The four cost categories of CAI are hardware, software, courseware (instructional content programs in addition to basic software, microfiche, video tapes, audio messages, etc.) and implementation (computer operations, educational administration and student counseling and guidance).

Austin reported evaluators of the Plato system (developed at the University of Illinois) and the Ticcit system (developed jointly by the Mitre Corp. and Brigham Young University) have found these four cost categories can become complex over time and "reapppear in quite disparate forms in the context of a real school or college."

High Costs Found

According to Austin, the cost of using CAI on the Plato system is averaging $2.05 per student hour. The component costs are roughly 60 cents each for computer and terminal, 50 cents for maintenance and 35 cents for communications. In addition, development cost is approximately $1,000 per hour of instruction.

Cost of the Ticcit system is less, but the instructional programs are limited. It costs 75 cents to $1 per student hour to teach English and math through Ticcit, according to Austin.

Austin gave the following reasons for delay in meeting cost objectives. The Plato hardware system consists of a large central computer linked to plasma panel terminals by means of communications interfaces and time-multiplexed communications channels. The original configuration contemplated 4,000 terminals on-line for each system.

Because of the large number of users involved, it was predicted the cost of delivering instruction on Plato would be 34 cents to 68 cents, the difference being attributable to possible volume cost reductions for terminals.

However, since those projections were made in 1970, the Plato developers have reduced their plans to 1,000 terminals per system for the foreseeable future. In handling communications to distant sites there has been a variety of methods used, frequently ordinary voice-grade telephone lines, suggesting the economies of multiplexed channels have been more the exception than the rule.

The Ticcit hardware system consists of a pair of minicomputers hard-wired to 128 modified color video terminals all located within a short distance. The developers' original estimate for delivering instruction was 35 cents.

During the two yeras when the Ticcit hardware was under development, there were uncontrollable increases in component prices and some design changes.

By and large, however, the hardware concept of Ticcit has remained fairly consistent with its original goals. Whether the low cost of delivery can be achieved will depend on the system's ability to drive all 128 terminals under conditions of full-time student use.

Best Measurement?

One might ask if the student contact hour is the best unit of measurement for evaluation. This seems to have been the most commonly used unit in recent years, but is it, in fact, the way school and college administrators view their budgets?

Austin believes that with developmental projects like Plato and Ticcit the initial cost analyses should be done in two ways.

First, development, production and implementation costs should be divided by the hours of actual use during the first two years.

This "would give a high hourly figure, but would fairly show how much utility the entire investment had in that limited period. It is natural for ambitious designers to hope their system will be used for many years by many institutions, but since that does not always happen, it helps to know what you actually got for what you paid."

Secondly, the costs of developing hardware, software and courseware up to the point of production and full implementation, including the educational administrations costs, should be divided by the hours of actual use in the first two years. "This would give a clearer picture of the costs of replicating the CAI program in another similar setting.

"If computer-aided instruction is absorbed into the instructional process in coming years to the point where it is taken for granted, I would then suggest the overall budget approach. This would treat the technology as a vehicle, just as buildings and books are vehicles, to carry students along toward a larger learning goal," Austin concluded.

Both systems (Plato and Ticcit) involved huge sums of federal funding. Organizations unable to tie into either of these systems cannot afford the development and operational costs of their own systems.

One must conclude that it will be at least the early 1980s before primary instruction via computer is feasible.

Couger is professor of computer and management science at the University of Colorado.

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By U.S., Soviet Scientists

Artificial Intellect Seen as Problem Solver of Future

By Sergei Ivanov
Novosti Press Agency

The concept of artificial intellect may seem fantastic, but U.S. and Soviet specialists working jointly on computer languages see it as a means for solving problems, from housing construction to clinical diagnosis and treatment.

Man communicates with computers in an artificial language of algorithms. But, at times, this language poses difficulties. Consequently, computer experts have been looking for other ways to communicate.

One is to teach the computer to understand voice commands. At present, there are computers which can identify about 300 words and pronounce 50. Unfortunately, computers have trouble dealing with voice inflections.

But, because of its potential benefits, "Automatic Speech Recognition," was the theme of one of 11 panels of the International Conference on Artificial Intellect that opened on Sept. 3 in Tbilisi in the Soviet Union.

The machine cannot understand a natural language without a translator. The role of translator is played by the so-called universal linguistic processor – a program that translates a text into a language that the computer can use.

Computers have begun to identify not only grammatical structures but also semantics. They are learnings to extract meaning from words and phrases and to form links between concepts.

The papers and discussions that took place during the Tbilisi scientific forum were related to the possibility of extending mutual understanding between man and machine.

The computer must have "common sense" – a code of universal axioms reflecting cause-and-effect connections between ideas that are fed into it.

Moreover, information about concepts relating to a specific problem and relationships between such concepts, known as "acquired intellect," also goes into the computer.

It is from all this data that the model of a real-world problem emerges.

Dr. Dmitri Pospelov, member of the organizing committee of the conference, called attention to the Utopist procedure compiled by a Soviet scientist, Enn Tyugu.

"A program of this type," he said, "is made in order to help the computer build its own program when it runs into a complex problem.

Robots Must 'Reason'

The Tbilisi conference agenda included a section devoted to robots.

To create robots which are capable of orienting themselves in an unfamiliar environment, identifying and classifying objects, planning their own actions and learning through the process of work, man must see that the robot not only acts, but "reasons."

The conference was shown "hexapods" designed by a team under Dmitri Okhotsimsky of the Institute of Applied Mathematics of the USSR Academy of Sciences. These robots are well adapted for motion over the uneven surface of a strange planet or over the ocean bottom.

If sent to unexplored planets, the robot must be able to report to earth, for instance, information concerning the shape of objects surrounding it. For this purpose, the geometric information it receives would have to be translated into algebraic language for communication.

This can be done with the aid of the Rita program devised by Siberian mathematician Alexander Narinyani and Moscow linguist Igor Melchuk.

Another technique, the Dilos system, helps establish a dialogue with a robot. Dilos can act as a universal adviser: Any information about any field of human endeavor can be put into the model it analyzes.

A similar system has been designed at the Massachusetts Institute of Technology to run supermarkets.

Problems such as planning new residential areas and community services establishments, so that one does not interfere with the operations of another, call for an information system with a flexible memory, common sense and a high intellect. Dilos might provide the nucleus for such a system.

Simulation Reveals Facts About Ice Age

KINGSTON, R.I. – Computer studies are showing scientists what the earth looked like 18,000 years ago when glaciers covered much of the continent.

From this information, researchers can discover why glaciers occurred, if they might do so again and how we would be affected if an ice age did return.

"I look at the world now as living at the limit of its resources," Dr. Ted C. Moore, director of the program, said. "An ice age would be catastrophic for us in this condition."

Sponsored by the National Science Foundation, Climate Mapping and Predicting (Climap) consists of a simulated model of what the earth was like using the temperature of the sea water as an indicator of the land temperature.

The sea surface temperature is constructed from the global climate data which gives the ice boundaries, the elevation, the measurement of nonreflective light and the estimated sea level.

The model indicates that areas we know today as dry might have been wetlands 18,000 years ago. Some of the farm land of today might have been deserts then.

The computer models of the climate development "simulates the earth's climate without really mimicking it, because the glacial world is so different," Moore said.

But because the sediments at the bottom of the ocean are the only global indicator, using actual fossils will indicate what the temperature should have been in order for that type of vegetation to have survived.

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Editorials

Defining the Fine Line

Increasingly, the areas of computers and communications are merging headlong into one indistinguishable mass.

From the user's viewpoint, communications can, of course, greatly enhance the capabilities of a DP operation. But when these two disciplines hurtle toward each other, there are associated questions that must be dealt with.

Communications services have been regulated under the Communications Act of 1934 because, at the time, it seemed to be in the public interest. Those companies that provide telephone, data communications and other services operate as common carriers under the Federal Communications Commission (FCC).

But in the DP area, government has kept a hands-off policy, allowing competition to determine the rules of the game.

This distinction between two vital areas is becoming increasingly difficult to define as communications services have more DP components and DP companies rely more on communications to provide their services.

To further confuse the issues, the FCC has introduced competition into the regulated areas, and vendors such as IBM now want to control satellites through subsidiary operations.

One of the key questions for users is cost. Is regulated computer/communications less costly than nonregulated computer/communications? And if these two disciplines are to remain partially regulated and partially nonregulated, how can the boundaries between them be clearly defined?

The FCC addressed these problems with its Computer Inquiry in the early '70s. The initial outcome did little more than define the ways in which the two areas can interact.

Now, as more proposals are advanced for so-called "hybrid services," the pressure is mounting for another inquiry that will have to determine how the long-term interests of users can best be served.

Silent Testimony

Courtroom 110 at the U.S. District Court in Foley Square, New York, is a lonely place. Except for the judge and attorneys for both sides, this large courtroom stands virtually deserted.

It is a sad commentary on the values of this society that a legal proceeding with potentially far-reaching impacts such as this antitrust suit between the Justice Department and IBM is being virtually ignored.

To be sure, some coverage of the trial is provided within the DP community. Aside from that, however, the general press and public at large pay scant attention.

Regardless of where one's sympathies lie with regard to the protagonists in the case, it seems to be a travesty of our legal system that government representatives have not generated any interest in the public they theoretically represent.

It might also sound somewhat trite to point out that the fiber of American industry is being tried.

It is too bad this trial will later be studied only by legal experts from official transcripts. As the lawyers like to say, there are many threshold issues being considered.

It is indeed too bad the media and the public are too wrapped up in their everyday pursuits to devote more attention. Perhaps this is silent testimony to the priorities we have set.

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Letters to the Editor

NCR Cooperation With Competitor Creates Happy Ending to DP Story

Computerworld readers may be interested to know how NCR responded recently to an attempt by Computer Enhancement Corp. (CEC) to penetrate the add-on memory market.

Having been an IBM, Univac and Honeywell user for close to 20 years, I felt I had experienced every mainframe/peripheral manufacturer situation that could be encountered.

When I announced to NCR that I would be installing 256K of add-on memory to one of our Century computers, I wasn't prepared for the reaction that followed.

A visit from a combined task force of NCR engineering, sales and management representatives was quickly arranged. At this meeting, the spokesman announced to CEC and our own management that their only concern was to make sure that, as an NCR customer, we got only the best in the way of usage and service from our computer and all the equipment attached to it, regardless of who manufactured it.

Policies and agreements covering installation, certification and future service were formulated and soon thereafter formalized in writing.

Needless to say, with this kind of cooperation, we were up and running quickly and with, to date, not a single hardware or service problem.

Wouldn't it be nice if all computer stories had a happy ending? Hats off to NCR, "That's the way we users like it, ahuh, ahuh."

Jim Edwards, Director
Management Information Services
Standard Brands Paint Co., Inc.
Torrance, Calif.

RPG User Acted Too Hastily

The article, "User Finds Self-Education Pays Dividends" [CW, Dec. 24], dealt with an accountant relying on "self-education and a software designer who knows his business" to computerize accounting applications.

My opinion is that this user and his programmer/analyst acted too hastily when they "quickly switched to Fortran and machine language after finding RPG-II too restrictive."

I find it hard to believe any in-house Indexed Sequential Access Method (Isam) could be cheaper to develop and more easily utilized than the one line of code on a RPG-II file description coding form, to mention nothing of RPG-II's flexibility in accessing files in other modes.

Earlier versions of RPG admittedly were somewhat "restrictive"; yet, when in its early stages, many DP professionals found it highly effective for processing "general ledger, payroll, billing" systems – effective enough for some major companies in the computer industry to invest many man-hours and dollars to expand it and develop a more versatile, high-level language.

Maybe "the user, who. . . .said getting the programs into operation took longer than he anticipated" should reconsider RPG-II. And maybe the "programmer/analyst" whose ego restrained him from coding in RPG should go back to the manuals and investigate its new sophistication (processing with arrays, tables, user subroutines, etc.) in this more finely tuned version of RPG.

David W. Belfield
Lakeland, Fla.

A Real Supporter Writes

I will attempt to put some of Adrian Register's questions about Laurance F. Wygant [CW, Dec. 24] to rest. I work with and/or for him as wife and/or program typist.

Wygant's 50-hour-a-week job is senior programmer/analyst for Pelam, Inc. in Chicago. He is slightly under the age of 30, self-taught in the field of programming, reads incessantly and would do more "other than technical" writing if his time permitted it.

His most recent programs include: Otis – an on-line (24 hour/day) terminal input system for a local hospital laboratory, a customized compiler for multiphasic health reporting and a software library of programs.

He writes two columns for the local Data General user's group (Capone) monthly newsletter, gives seminars for them and is currently software chairman for the national Data General user's group.

Bonnie Wygant
Chicago, Ill.

Taylor Chided for Oversight

Alan Taylor objected to the failure of a firm soliciting business by mail to purge its mailing list of duplicates [CW, Dec. 24].

Even a cursory examination of the two mailing labels reproduced to make the point revealed they were printed on different printers. The label on the left was prepared on a drum-type printer while the label on the right was prepared on a train-type printer (or a perfectly adjusted drum printer with a different type font).

Further, Taylor, from his association with *Computerworld*, should be well aware of the common practice of renting mailing lists. He should also know that frequently, when a mailing list is rented, the vendor provides preprinted labels rather than machine-readable media to protect the mailing list from unauthorized use and from theft.

This apparently was so in this case, and there is no way the firm making the solicitation can, at a reasonable cost, purge its mailing list. Taylor, shame on you.

Jerome H. Gitomer
Olney, Md.

(Other letters on Page 16.)

The Problem of Identity

Go back in your mind to the early days of plastic money. For me, it was an air travel card supplied by the jet engine division of General Electric that started it all; for some readers, it may have been Diners', or a gasoline charge card. In the Fifties, there was little or no use of signature spaces on the cards themselves, although signatures were of course required on the paper forms of various sorts and sizes that confronted one. In fact, the whole process was quite elitist: the mere possession of such a card was assumed to identify you as someone of unusual probity, entrusted (by your company) with the means for unlimited domestic or even international travel. I remember wistfully that if one casually dropped an Admiral's Club or Ambassador Club card – also rather closely held, twenty years ago – the overall effect was quite pleasant and ego-bolstering!

Some years later, a space for an identifying signature was added to many of the rapidly proliferating types of credit cards. The gasoline cards were holdouts for many years, but now have almost entirely succumbed; the companies concerned presumably realized that station attendants would never compare the signatures anyhow.

Then the first mag stripes appeared – nonstandard in size and location, and of course even more wildly so in recording modes and data formats. Presumably eye color, visible scars of halitosis intensity could have been secretly encoded somewhere in the thin brown smear, as in the drivers' license Soundex digits, but I'd guess it never was.

And lately some of the bank cards have begun to use color photos on the back; sort of a rogues' gallery *in verso*! Who knows: fingerprints, footprints, retinal patterns, voiceprints?

Here in California, meanwhile, the possession of a book of checks is almost meaningless. They must be imprinted, and with your address as well as your name; if the telephone number is not shown, stores insist on it being written. And a check cashing card to match the checks is almost obligatory.

To use a BankAmericard for a small Christmas purchase the other day, I had to show "one other credit card," a driver's license with photograph, and write my phone number on the slip! And when I perhaps rather sarcastically offered my check cashing card, the clerk solemnly wrote *that* number on the charge slip as well. Oh, and the signatures? No one looked at any of them!

Something needs to be done. Of course the really sensible thing would be to go Swiss and carry a giant roll of currency (giant, because many places won't change a big *bill* without an ID!). A super-snooty solution would be to deal only with outfits that don't use plastic identification: Tiffany, W.J. Sloane, the Ritz Carlton. Alas! it's hard to fly from San José to Sacramento via a Boston hotel travel desk.

What is happening is a compound of several social and business trends: transient customers, transient credit and bank accounts, transient sales clerks, and a great rise in rip-off artists; credit managers and accountants vying for low losses – and not caring about customer anger or reduced total sales; that's another manager's problem; and a failure to use the identification already available. Clerks are instructed to ask for more and more information, while no use is made of the data available. Signatures and photographs are ignored. The obvious fact that a professional criminal will have the full paraphernalia of identity and can produce *all* of the cards that were in the pickpocket victim's wallet – that is brushed aside.

I advocate the following simple policy: (a) compare signatures, (b) check that the card is not reported stolen and that the account is not overdrawn. Forget the driver's license bit; forget the never-verified telephone number; forget calling for extra cards.

Three things are needed from the hardware and software boys, two immediately and one long-range. From Ma Bell and her competitors, a very cheap-to-rent credit verification terminal that accepts the customer's cards and a store ID card which also does the dialing. From the retail and banking communities, working through either industry or ANSI standards committes, an immediate freeze on the dimensions and input media and codes and formats minimally necessary to utilize the hardware – AT&T could force them if necessary, as IBM years ago "standardized" the punched card.

Long-range, we need a new universal identifying technique. Perhaps chip technology will bring it: a dozen 16K chips ought to be able to do all kinds of elaborate, super-redundant checking. The transducer is the challenge – the OCR signature scanner, the fingerprint reader, the breathalyzer, the retinal or earlobe blood vessel sensor. The code to compare with can be in or on the credit card, perhaps confirmed over the data link along with the customer credit balance.

I honestly believe that the bank or department store chain which lightens the present ridiculous burden of customer identification, and the indignities which frequently ensue, will reap a rich reward in extra business and in more efficient credit processing. Present tendencies are ugly, dehumanizing. We can do much, much better.

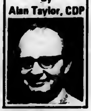
Herb Grosch

CPAs Challenging DPers With Two-Level Competence

The Taylor Report

By

Alan Taylor, CDP



All the various DP professional societies basically share a single approach to professionalism. Professionalism, they say, is something carried out by someone who is professionally employed.

The focus of this definition lies on the person, on his background and his personal qualifications. If these are sufficient, then, provided that he is not dishonest, etc., his work can be assumed to be professional and should be honored as such by management and public alike.

Practically, this approach is an enshrinement of on-the-job training (OJT), even though much DP work involves treating situations that are technically new and unprecedented.

OJT is a dangerous path to follow when breaking new ground, because, by definition, the training cannot have faced up to the new situation.

At best, OJT can have provided some pointers but is that really enough? More practically, is there an alternative approach that can somehow handle the problem better?

Now it appears there is and has been for at least a year such an alternative. It is contained in the American Institute of Certified Public Accountants' (AICPA) 1975 publication, "Statements on Management Advisory Services" (1211 Avenue of the Americas, New York, N.Y. 10036).

These AICPA statements offer a two-level competency approach which focuses on the task, rather than on the practitioner. This forms the basis of a whole new and effective way of providing DP standards. They are in use for the ever-more-important management advisory service (MAS) practices of the auditing firms. These MAS operations are primarily DP-oriented and are estimated as now, after only 10 years in existence, bringing in a third of the volume of business as the auditing operations are doing after their 50 years or so of existence.

So the new approaches are certainly associated with a financial success story that can't be ignored by the rest of us.

So here is how they are working it. . .

Task Competence

The first level of competence offered by the AICPA statements is competent perforance of the specific task.

The rules lay down a number of requirements which must be met before any task can be considered competently performed, rather than laying down qualifications for the practitioner who performs the task.

It is hot, for instance, a requirement or even apparently a recommendation that certified public accountants (CPA) should be employed on DP tasks. What is required is that whoever is employed is competent for the task and performs the task competently.

Competent performance of a task includes, under these guidelines, requirements such as that the practitioner maintain, in his own files, documentation of all substantial questions that come up, of his investigation of all important aspects of the questions and of the reasons behind any recommendations he makes. All these things must be written down and preserved for possible future inspection.

Now that is something none of our current DP societies require a professional to do. Why not?

The AICPA professional must also maintain in his file details of how the results of his investigations are presented and how his recommendation is presented to whoever has authority to accept it.

This also is regarded as another requirement of competence on the job. The best possible recommendation, presented with a wrong or inadequate explanation of the alternatives or recognition of the dangers involved, is not regarded as being professional simply because it was technically correct, under these rules.

Is there any reason why wrongly presented recommendations should be, I wonder? So much for the first AICPA level of competence.

Management Competence

The AICPA requirements don't stop at task competence, however. They go right into the problem of management and, again I think, do it rather effectively.

Not unnaturally, here they do tie the CPA qualification in. They require partner-level management of all projects, CPA-firm partnerships happen to be reserved for CPAs. This, however, is just an incidental, so far as the use of the AICPA professional-standards methods work. There is no intrinsic reason why non-CPAs can't carry out the same management competently, so far as I can see.

The management competence requirement really is to supervise that the technical competence is present in the particular project. Now that doesn't absolutely require technical competence.

You don't need to know details of how compilers are put together to see whether the project files contain balanced or unbalanced presentations or real investigations, rather than those pulled-out-of-the-air answers anyone can give without professional consideration.

And it doesn't take much technical understanding to review old files of previous projects undertaken by the project leader to see whether he has successfully brought out dangers and warnings of problems that have subsequently occurred or to see whether his forecasts have been correct in the past.

This does require high seniority and responsibility – so the AICPA requirement of partner-level supervision is valid, even though the CPA exam in itself is no evidence of technical knowledge.

Practical Result

In practice, these AICPA standards won't have to be changed with the advent of technical innovations or the discovery of problems in current systems.

They do plant the seeds of malpractice problems – but that is a danger the auditing profession has become uncomfortably used to living with anyhow.

And they do mean that the technical people, after leading one client down the rosy path to disaster, no matter how innocently, will be much more closely supervised afterwards, because of how their record looks – and because the standards require managerial competence as well as technical competence.

And why shouldn't closer supervision follow upon even innocent disaster?

As I see it, this is an easier way of obtaining DP competence than any the DP societies have suggested. Now the ball is in their court.

If they don't want to permit a practical DP takeover by the auditors, then it is time to adopt as good or better a set of standards as those AICPA has developed. What about it?

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Reader Commentary

'Sour Grapes' Taint Report Criticizing Distributed DP

By Sy Bosworth

Special to Computerworld

In an interview article headlined "Reports on Momentum to Distributed DP Exaggerated" [CW, Nov. 19], Peter F. Zinsli's premise was logically insupportable.

He defined distributed processing in terms so narrow they appeared to describe only those areas in which his competitors' data entry products were technologically more advanced than his own.

Zinsli then claimed that such advanced systems are not being seriously considered by many computer users, and he implied further that this is rightly so.

Unwilling to share his portion of sour grapes, we must wonder whether Zinsli would be equally negative about distributed processing if his company could offer a data entry system with communications capability, mass storage, a versatile user-programmable language and a powerful processor, all at a competitive price.

Distributed processing, properly defined, includes not only remote data entry but also intelligent terminals, transaction processors, computer networks and dedicated stand-alone minicomputers.

Judging by increases in new product offerings, active feasibility studies, requests for proposals, orders and installations, the momentum toward distributed processing is probably greater than is claimed even by its most enthusiastic supporters – understated rather than exaggerated.

A similar conclusion might be reached by viewing the actions of IBM. Not generally noted as a radical innovator, IBM is now firmly committed to this new development.

In a newsletter dated November 1975, IBM said, "The concept of distributed data processing is becoming increasingly more important to large companies as they seek to take maximum advantage of that powerful business tool – the small computer."

New terminals such as the 3790 and new data communications capabilities for the System/32, the System/3 and the System/370 offer ample evidence of IBM's belief that distributed processing is in a rapid growth phase.

Not Mutually Exclusive

Nor does IBM appear to share Zinsli's belief that large-scale centralized facilities and distributed DP are mutually exclusive. The relationship between the two is better described as symbiotic than as hostile.

Distributed processing ought not to be considered a challenge to the centralized computer, but rather as an enhancement of its capabilities.

Zinsli made a number of other errors in fact and in interpretation. He said, "Your real processing gets done where your files are. It's very unlikely the user would want to put data in a remote file without the central file receiving the same data."

Not so. With rapidly decreasing costs for minicomputers, for mass storage and for data communications, it is entirely feasible to duplicate complete data bases at remote sites or to have only appropriate portions of the total data base maintained remotely.

As a third alternative and not at all an unlikely one, the central file might contain only summary information. The choices are not mutually exclusive; in combination they can provide optimum solutions to any problem.

A Rebuttal

Zinsli: "The distributed system user is left with the problem of justifying redundant files."

No he isn't, redundant files can justify themselves. They are an effective means of assuring system reliability by providing off-site data backup.

Zinsli: "A satellite processor system needs systems analysts to get it off the ground and then support people to keep it going."

Yes, but there are at least two cost-justifiable approaches. The central processing facility may choose to assign analysts and programmers to satellite stations on an as-needed basis. Or, the company may acquire its system from a turnkey supplier which can provide additional resources to augment the company's own staff.

Zinsli: "In recent years, corporations have [been] pulling 360/30s, 360/40s and the like out of their branch offices and putting in remote-job-entry [RJE] terminals linked to a large central mainframe."

True enough, but misleading. Today's RJEs can function as distributed DP stations with more power than 360/30s and 360/40s; the change does not represent a move away from distributed DP; it represents a move toward it.

RJEs are able to use the full capability of the host computer while providing additional power for local stand-alone functions.

Zinsli: "Centralized key-entry operations are still the efficient data entry answer for many firms."

Of course, but then distributed DP networks are the best answer for many other firms. That an older solution remains efficient for some users does not negate the fact that a new alternative can be more effective for others.

Zinsli: "Users complain about dealing with the central DP site, but the central DP shop can often justifiably place the blame on poor-quality data from the users."

Fair enough. But one way to resolve such disputes is to stimulate managers to upgrade the quality of the data they produce. Perhaps the most important argument in favor of the distributed DP concept is that it places the responsibility for providing good-quality data – and for developing effective uses for that data – squarely in the hands of the user/manager.

It appears that, for whatever reasons, Zinsli has chosen to oppose a force that is rapidly becoming irresistible. In a friendly fashion, I suggest that if he can't fight it, and he can't, he had better join it.

Bosworth is marketing director of STC Systems, Inc. of Maywood, N.J.

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Letters to the Editor

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My company provides a complete multiple-mailing system for the warehouse distribution industry. When our customers first enter their customer data base, a few duplicates show up which are quickly eliminated.

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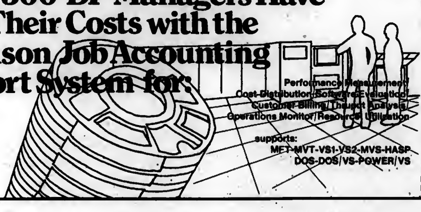
- We have a parenthesis option in the name field. Any characters in the name enclosed in parentheses are ignored for purposes of sorting.
- We maintain an alphabetically sorted customer catalog for several reasons. For instance, one may obtain a customer's account number during on-line sales by requesting a display of a small section of the catalog on the CRT.
- We can thus print a complete alphabetical list of customers, one per line, and eyeball it to eliminate duplicates. This is practical because none of our installations has more than a few thousand customers.

For larger data bases, one needs at least a three-field sort: Zip code, street address and name. If the first two fields match, the printout should be flagged for possible duplicates.

Also, it is possible to edit the existing data either with our parenthesis option or by inserting any delimiter to indicate the starting sort character.

Samuel H. Dorfman
Senior Systems Analyst

Business Data Systems
Conshohocken, Pa.



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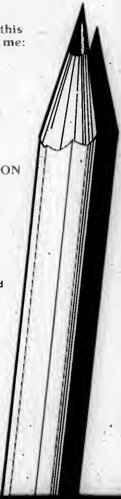

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EDP/PR Publishes Survey

'Performance' Packages Back CPU Vendors' Software

By Don Leavitt
Of the CW Staff

PHOENIX – Most performance evaluation projects involve software in one way or another, and most of this software is produced by independent software houses rather than by the mainframe vendors themselves.

Performance Evaluation

In fact, many packages are created solely to make up for a deficiency in a manufacturer's standard software, editor Phillip C. Howard noted in the lastest *EDP Performance Review* (EDP/PR).

For the third year in a row, the December EDP/PR surveyed what Howard considers "performance-related software packages." His overall objective was to list packages developed primarily for the purpose of performance enhancement, encompassing, as he pointed out, "not just central system performance but people performance as well."

The dividing line of what was included and what was omitted was "not clear cut, and some may take exception to [the] choice of categories," as Howard himself admitted. But, be added, be hopes the 28 pages describing literally hundreds of packages "will serve as both a reference source for performance projects needing software tools and as a stimulus to thinking about new possibilities for improving performance in your installation."

To save the reader from looking for things that were not in his survey, Howard omitted such classifications as data base management systems, report generators and documentation packages because "tbeir principle reason for being seems to be more in terms of functions than strictly performance."

He also did not include packages for very small systems, packages offered by overseas vendors and packages for second-generation systems. Beyond that, he said, packages were listed only if they are actively being marketed.

That still left a spectrum ranging, as Howard put it, "from the large, established software companies providing quality products with strong support and documentation to the individual wbo offers a package strictly by mail with minimum support and documentation. Caveat emptor."

The product listings themselves were organized into 13 classifications, with a brief introduction to each summarizing the types of packages and the general benefits to be expected in eacb area. Although some classifications may seem surprising – "Communications," for one; perhaps "Translators/Simulators" for another – most covered classic performance evaluation tools.

Two changes were made in classifications in this latest survey, however. First, the classification "Spoolers" was combined with "System Software" because, Howard noted, there are so few packages remaining that perform only the spooling function; most now provide otber operating system functions as well.

In addition, a separate classification for "Librarians" was added to reflect the supportive role thia type of package plays in the program development process – clearly one of Howard's acknowledgments of packages encouraging better "people performance."

Surprisng to some unfamilair witb EDP/PR surveys was the continued inclusion of "Hardware Monitors." The "boxes" listed, with their probes and, in aome cases, tape units and CRT display panels, are far more than software per se, but it can be reasonably argued all of these units require software to reduce the data they capture into human-readable form.

The specific listings of products included only the barest essentials and were intended primarily to identify the product alternatives available rather than provide enough information for real evaluation.

Users interested in particular producta were urged to refer directly to a vendor for more details, and EDP/PR included an index of all the vendors' addresses to simplify that effort.

Published monthly by Applied Computer Research, Suite 298, 8808 N. Central Ave. here in Phoenix 85020, EDP/PR is available for an annual subscription of $48. Single copies are available for $5 each, Howard noted.

NCR Shifts 'Spirit' to Full Century Line

DAYTON, Ohio – NCR's Sales Processing Interactive Real-Time Inventory Technique (Spirit) software, introduced in 1974 only for the mini-based Century 8200 system, is now available for Century 101 and larger computers as well, the company said recently.

The software was designed to provide on-line entry and inventory control. Users who start with 8200 installations can move their applications to the larger equipment with rewrites of the programs.

Using CRT terminals, Spirit supports real-time processing of orders and enables users to produce picking tickets, packing slips and invoices as byproducts of the basic order-entry process..

The system also supports periodic batched transaction processing for inventory control, accounts receivable, accounts payable, payroll and general ledger. It permits on-line input – through CRTs – for payroll, accounts payable and general applications.

Corrections to the accounts receivable application files are entered through the teletypewriter unit, a spokesman explained.

Reports produced by the system cover back orders, canceled orders, daily shipments, daily orders received, customer order number cross-reference and back-order tickets.

Other output includes inventory valuation lists, buyers' reports, below-minimum warnings and accounts receivable delinquency summaries, NCR said.

Spirit functions on a 32K Century 101 with two NCR 656 disks, three to 16 CRT units and a communications multiplexer or on a 96K 101 with multiprogramming, an additional disk unit and at least four CRT devices.

For either system, tbere is an initial installation fee of $3,135 for the Spirit software, whicb is ready for immediate delivery, NCR added.

CMG Meet Planned for Zurich

ZURICH, Switzerland – A European chapter of the Computer Measurement Group (CMG) will be organized early this year, Scott N. Yasler, chairman of the CMG/EUR formation committee said recently.

According to present plans, the organizational meeting will be held here in Zurich in March and the first full meeting of the regional group is set for June.

A member of the performance measurement department of the Union Bank of Switzerland, Yasler noted invitations have already been sent to "several large European companies and users of measurement" tools and tecbniques.

Membership, however, is wide open and inquiries are welcome from all current users and people in Europe interested in hardware or software measurement capabilities.

As an affiliate of tbe U.S.-based CMG, Yasler expects CMG/EUR to provide seminars, workshops and presentations by various suppliers on a fairly informal basis. While common problems can often be identified and solutions sometimes found in such gstherings, the interchange of ideas will continue between meetings through publication of a regional newsletter if CMG/EUR follows the example of other regional CMGs.

In addition to the more-or-less local meetings to be held several times a year, members will also be able to take part in the annual international CMG meeting, which provides a more formal setting for the presentation of user experiences from the entire measurement community.

Yasler was unable to name either the exact date or location of the CMG/EUR organizational meeting, since these may vary with the amount of interest he finds in establishing the group.

Yasler can be reached at his department in the bank at Bahnhofstrasse 45, 8021 Zurich.

SBC Produces Graphics on 2741

GREENWICH, Conn.,– A hard-copy plot and graph capability that enables users to graphically display information generated by the Service Bureau Co.'s (SBC) business planning, analysis and control systems, Picture-Pac is now available on SBC's Call/370 time-sharing service.

No CRTs, flatbed plotters or other special hardware are needed to perform tbe standard illustrations, the company said.

Time plots, scatter diagrams, bar charts, variance charts, histograms and pie charts can be handled on an IBM 2741 terminal or its equivalent, a spokesman added.

Sixty different options are also available to control items such as grid width, page width, titles, number of decimals and other factors. A "daisy wheel" printer is needed for these services, whicb require either a Trendata 400, Anderson Jacobson AJ 830 or Univac DCT 300 terminal.

The Picture-Pac user specifies tbe types of illustration desired and the data to be used; all other specifics are handled automatically by Picture-Pac unless the user chooses to exercise more control over these options, SBC said.

To receive an illustration, the user types in one of six commands depending on the type of graph desired.

Call/370 and Picture-Pac are available throughout the U.S. SBC is headquartered at 500 West Putnam Ave., 06830.

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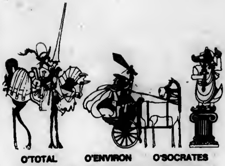
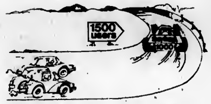


The luck o' the Irish.

Cincom announces
"April Thinker's Day."



TOTAL roared to its first "500".
And the next "1000" look like a sure thing, too.

Have a June ceremony.
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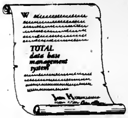
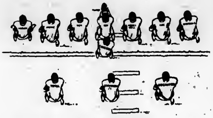


Cincom Declares
Software Independence Day



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Over the past 12 months we hope you have enjoyed our topical themes highlighting the Cincom story and how our products/services have contributed to the "data base — data communication" successes of the industry.

1975 has been good to Cincom and . . . apparently . . . to our clients. According to the brand new Datapro Research Corporation survey, "User Ratings of Proprietary Software", our *TOTAL Data Base Management System* received a 3.3 out of a possible 4.0 overall user satisfaction rating, with 90% of the users rating the product Excellent (44%) or Good (46%).

And . . . TOTAL had over *3 times* the number of user responses to the survey than the next rated DBMS.

The same survey reported that our *ENVIRON/1 Data Communications System* achieved a 3.2 overall user satisfaction rating (tops for all rated DC systems), with the categories of Thruput/Efficiency, Ease of Use, and Ease of Installation leading the way.

We look forward to 1976 with enthusiasm and optimism . . . new products, new installations . . . continuing friendships. If this is your year to move into data base and/or data communications, *make sure* it is a good year by joining the successful 1000-strong Cincom client family.

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Move to Outside Service Brings Little Loss of Control

Special to Computerworld

LONG ISLAND CITY, N.Y. – *Question:* Where do you look for help when your computer goes out the door? Especially when you've relied on it for years for personalized reports and a marketing edge in a fiercely competitive business?

Answer: Right in your own backyard.

That "backyard" for A. Goodman and Sons, Inc., a 110-year old firm best known for its noodles and kosher products, was the local data center of Automatic Data Processing, Inc. (ADP), a nationwide computer services firm. For years, Goodman has used ADP for payroll processing, even during the time it had its own disk-oriented IBM 360/20.

When that computer was released in October 1973, Goodman evaluated the alternatives to in-house automation and selected ADP for additional applications.

The decision wasn't easy, however. Goodman had come to rely on its own computer for some very basic bookkeeping. So had its distributors.

The company is actually in three businesses: noodles and other pasta products marketed regionally through chains and independent grocers; kosher foods sold nationally; and bulk-packaged foods for industry and institutions.

The business is highly competitive, usually local or regional. No single firm sells pasta products across the U.S. in strength. Goodman's markets mainly along the Eastern seaboard; until 1966, the company marketed directly to chains and independent grocers.

At that time, a card-based 360/20 was installed and the pattern changed. Goodman decided to market all its products through distributors, helping to put four such firms into business.

The company produced delivery tickets and invoices on its own computer, billed chains directly and provided distributors with bills on its letterhead for independents.

The system worked well. Distributor salesmen took orders on sheets scanned by an optical page reader. The computer produced truck manifests and actual delivery tickets, about 800 a day. It also printed final invoices, all priced and extended.

Couriers delivered some bills with the goods, picking up orders at the same time. Pricing was handled differently for chains and independents. At the end of each week, a recap of delivery tickets created direct chain billing.

"We got used to the convenience and speed of our own computer," Robert Cowen Jr., vice-president and treasurer, said. "The timing was almost split-second. The trucks would not roll until the processing was completed here. The whole procedure was tightly controlled; we knew the bills were accurate."

The chains shared Goodman's confidence and accepted its figures without requiring the company to fill out the usual forms. "We used our computer to continue our fine relationship with every single chain in the New York area," Cowen said.

In addition, Goodman received a complete set of reports, all personalized and tailored to management's needs.

Independence Day

All of this changed, however, on Oct. 1, 1973. For one thing, the distributors wanted to be more independent of Goodman, free of dependence on a computer system as far as 25 miles from their warehouses. Goodman agreed.

As a result, Goodman turned all marketing over to the distributors, including a number of products the company brokered but did not manufacture. The computer was released and the billing service stopped. The distributors were given full responsibility for billing.

While the decision made its distributors more independent, flexible and competitive, with higher commissions made possible by direct cost savings, it also presented problems. Goodman still wanted some form of computer processing and minimal problems in any conversion.

Goodman is now using ADP for accounts payable and accounts receivable as well. While basically packaged systems, the applications sport a tailored look.

Some Loss

"There's no question that this service gives us a good view of our business," Frances Kalman, assistant treasurer, said, "even though we gave up some control and information, including sales statistics."

Accounts payable was the first conversion. All vendor invoice data goes to ADP once a week, plus any Goodman transactions like handwritten checks or partial payments. One person works four or five hours a week on the application.

ADP delivers a wide variety of reports, including a voucher and distribution journal, a check register and an open item list. At the end of the month an expense distribution serves for entry to general ledger.

The advantages of the accounts receivable application are just as timely, Kalman said. Goodman completes ADP input forms, recording customer number, date and amount of invoice on daily sheets. When checks come in, tear strips on these sheets serve as cash receipts documents.

Besides ledger information, Goodman gets statements, an aging report and a distribution by territory. Portions of the account number identify the sales terminology, a start on sales analysis.

During 1975, Goodman acquired an IBM System/32 to handle billing applications on an in-house basis, but Cowen was quick to note this has had no effect on the company's relationship with ADP.

7 programmers,
2 supervisors,
the "impossible" 2500 programs,
and MARK IV

As reported
by George Seeley
Supervisor of
Division Systems
Fiber Glass Division
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"We did it in three years from scratch — designed, implemented, and went operational with:

1. a product-costing data base covering 5000 products
2. an order-entry and invoicing system for annual sales of $90 million, and
3. programs covering all divisional DP requirements for daily operations — personnel, payroll, accounting, product planning and marketing.

"And we did the entire job — some 2500 programs in all — with just seven analyst/programmers and two supervisors.

"The key to this 'impossibility,' as some genuinely felt it to be, is the MARK IV® System.

"We had tried to develop our Order Entry System in Cobol, but user requirements changed so rapidly we were unable to provide quick response. MARK IV gave us overnight turnaround. We were able to meet schedule requirements that would have been impossible with Cobol or PL/1.

"In developing our product costing data base with MARK IV, we designed and programmed as we went along. in conjunction with IMS and DL/I — and MARK IV is a natural teammate with DL/I — we completed our work in a fraction of the time it would have taken with Cobol. And we didn't have to teach our people any new langauges.

"Now we have a product-cost data base that gives us the complete picture from raw materials and labor to inventory and material requirements. And we're implementing another MARK IV module for work scheduling. When it's finished, we'll have a tailor-made system that meets our information needs from start to finish.

"Our system has been running for about a year. And with extreme reliability."

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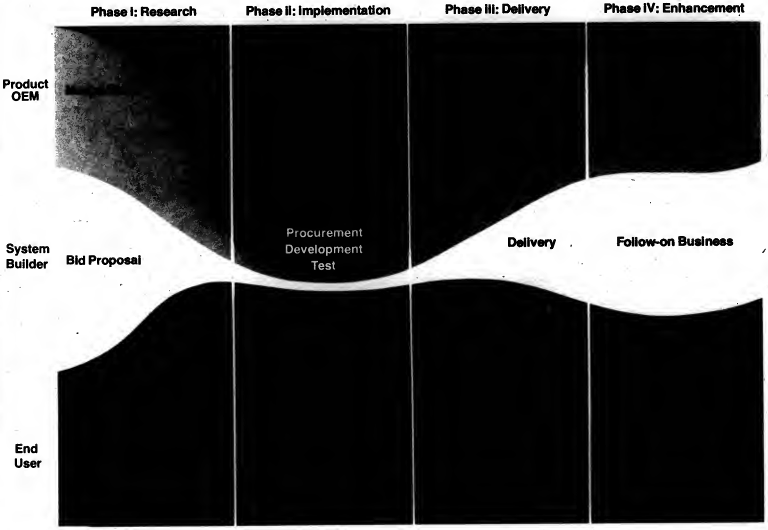

YOUR COMPUTER'S LIFE CYCLE.

Interdata's computer products and services exist for one reason—to satisfy our customers. The key to our business is understanding our customers' business needs.

There are three types of computer buyers:

The Product OEM buys large quantities of identical computers, adds special software and hardware, and sells a resulting product.

The System Builder buys computers and peripherals, packages them into a system, adds proprietary software and delivers them to fulfill a specific customer need.

The End User buys a computer system to solve his problem.

Each of these buyers goes through a Computer Life Cycle consisting of four specific Phases—Research, Implementation, Delivery and Enhancement. Interdata responds to the specific needs of the computer buyer during all four Phases of his Computer's Life Cycle.

If you are a Product OEM, System Builder or End User, you might be interested in reading the next page to find out how Interdata can make your job easier.

The following description is the essence of the Interdata concept called Computer Life Support.

Phase I: Research

Computer Life Support begins here. The Product OEM studies his market to determine just what his product should be, where it fits and how much it should cost. The System Builder produces a bid proposal aimed at solving his customer's specific problem. The End User is interested in defining a computer-based solution to a problem and justifying this project to management.

Interdata recognizes that each kind of customer has specific needs during this Phase. Here's how we respond to them.

Product OEM. In studying his market, this customer must gather competitive data, do a ROI analysis, a feasibility study, and—ultimately—determine what products to make or buy.

Interdata makes available cost information over the projected product's life cycle. We will discuss our development plans to help you with your planning. We have field analysts and systems engineers to help with specifications. And we help identify the tradeoffs of any make-or-buy decision.

System Builder. This customer needs responsive project and proposal support. He demands a professional relationship with his computer vendors. And he must identify what equipment meets his performance specifications.

At Interdata we format our proposals to your requirements. We offer technical support plus special products and services to fill your needs. And we back this all up with our policy of not competing with our customers.

End User. This customer needs an easy-to-understand computer system. He's interested in near term solutions yielding long term profits. And he must know that his computer can do the job.

Interdata computers have familiar IBM-like architecture supported by thorough documentation. We show you similar applications and provide local benchmark and demonstration facilities.

And, as a subsidiary of Perkin-Elmer, we bring you the resources and financial stability of a multimillion dollar corporation.

Phase II: Implementation

In the Implementation Phase, very similar tasks must be performed by each Interdata customer—be he a Product OEM, System Builder or End User. Each customer must take his computer through procurement, development and testing.

Procurement. The primary need of every customer is an equitable business arrangement with his computer supplier. He must have the proper set of terms and conditions.

Interdata offers the Product OEM a quantity discount agreement; the System Builder a dollar volume agreement; and the End User terms and support tailored specifically for him.

Development. Here all customers want to optimize their design and meet their schedule.

Interdata provides a full family of compatible hardware, software, peripheral and service products so you don't have to start from scratch. We have easy-to-use program development tools like BASIC, FORTRAN, MACRO CAL, COBOL and a multi-terminal development system.

Test. At this point the customer needs to minimize the possibility of system failure.

Interdata provides system debugging and integration aids such as hardware memory protect and privileged instructions.

Net Results. You can benefit from Interdata support during Implementation in three critical areas: Lowest overall price. Optimum computer performance. And on-time systems completion.

Phase III: Delivery

At this Phase of a computer's life cycle, our customers again have distinct tasks: The Product OEM must produce as efficiently and economically as possible. For the System Builder, on-time delivery is critical. And, the End User wants to cutover his system as soon as possible.

Product OEM. This customer wants to minimize recurring product costs. He wants his computer equipment to be reliable and delivered on time. He also wants to increase the value he adds to his product.

Interdata reduces your recurring costs with unbundled hardware and software modules. Our products are reliable because of our conservative design and stringent quality control procedures.

For vertical integration, Interdata sells computer board sets to allow you to increase your value added.

System Builder. To meet delivery requirements, he must have reliable computer equipment backed up by responsive field service.

Interdata's quality control assures you of no on-site surprises. We 100% test all our incoming parts. We put our computers through a unique "shake and bake process." We solve product problems in the factory—rather than in the field.

End User. When cutting over to production, the End User needs service. Accordingly, Interdata provides four field service programs: resident service; contract service with fixed price on parts and labor; on-call service for which we charge for parts and hourly labor; and depot parts maintenance service.

Phase IV: Enhancement

In the final Phase of the computer life cycle, the Product OEM is working to extend his product's life. The System Builder is looking for follow-on business. And the End User wants to expand his system.

Product OEM. This customer's concern is to avoid product obsolescence.

Interdata offers you improved product performance through upward compatibility. Or, you can lower your product's price by taking advantage of the next generation of interdata computers.

System Builder. To capture follow-on business, the System Builder needs to transfer his experience, training and software from one system to the next.

Interdata makes transferability easy because of our familiar, large-machine architecture and complete family compatibility.

End User. For this customer, system enhancement means system expansion.

Interdata's computer architecture allows you to expand all the way from a single board 16-bit processor to a $300,000 32-bit MEGA-MINI™ computer system.

Find out more. Interdata's responsiveness to your needs during every Phase of your Computer's Life Cycle adds up to Computer Life Support. If you are a Product OEM, System Builder or End User, we have a lot more to tell you. Just send in the coupon. Or call us.

CW 1

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I'm a (check one) ■ Product OEM ☐ System Builder
■ End User who wants to know more about Computer Life Support.
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Without Right Tools, TSO Study 'Doomed to Failure'

By Don Leavitt

Of the CW Staff

Performance Evaluation

WASHINGTON, D.C. – The TSO Performance Analysis Program (TSOPAP) is a data reduction program that analyzes TSTRACE data and produces various reports reflecting activity and performance under IBM's OS Time Sharing Option (TSO) – and any study of TSO performance that doesn't use TSOPAP or similar data reduction software is "doomed to failure," in the opinion of Donald R. Deese.

Chief of one of the directorates within the Federal Computer Performance Evaluation and Simulation Center (Fedsim), Deese noted TSOPAP was originally written by John Juhiman of IBM while at Proctor & Gamble in Cincinnati. Like many other user sites, Fedsim acquired TSOPAP "via Share contacts," Deese said.

In material prepared for a professional development seminar last year, Deese noted there are many versions of TSOPAP since users – including Fedsim – have modified the program. Performance evaluation is a somewhat personal thing, he indicated, and the changes, wherever they have been made, were generally intended to produce "better reports, to report different data and to correct certain errors."

TSTRACE, the heart of TSOPAP, is an IBM-supplied task which operates in its own region, usually 20K. It has "surprisingly few functions," according to Deese, who noted it obtains buffers and places the address of the beginning buffer in the TOS communications vector field, TSCVTTRB.

The actual statistics accumulation process, however, is performed by the Time Sharing Interface Program (TSIP) if a buffer address has been provided to TSCVTTRB. If that address is present – and TSTRACE has therefore been activated – TSIP moves the first three words of the Driver parameter area into the buffering area.

Fear of Overhead

Many installations fear running TSTRACE because of the overhead associated with the task, Deese acknowledged, and this fear is "most likely" caused because TSIP normally collects data for all of the Driver entry codes.

Four of these codes, however, are generated by the TSO Dispatcher, the analyst continued, and these often represent an overwhelming percentage – "usually over 95%" – of all codes. Collection of these codes, which report activity over which the user has little control, can be eliminated "by a simple, well-tested modification to TSIP," Deese said.

Collection of the remaining Driver entry codes generates so little overhead it is feasible to run TSTRACE for the duration of the TSO operation. The 20K memory requirement "might be hard to squeeze out of some systems," he agreed, "but it usually can be done."

TSO performance itself can very definitely be affected by the use or abuse of certain user-selectable parameters, Deese indicated. In systems with multiple foreground regions, the TSO Driver assigns each TSO job to a particular region when the user logs on. The first criteria it uses to select a region is the size of the user job.

After eliminating from consideration those regions that are too small, the Driver uses one of three standard selection algorithms designated by the installation. These are controlled by the NOACTIVITY parameter, the ACTIVITY parameter or the DECAYACT parameter, Deese noted.

The simplest technique, using the NOACTIVITY entry, is to assign the user's new job to the region that currently has the fewest jobs. This keeps the number of jobs relatively even but does not necessarily balance the workload, and this parameter is inappropriate for two or more TSO regions, Deese went on.

The ACTIVITY parameter triggers a monitoring of average activity for each foreground region and, when a new user logs on, the driver selects the region that, on the average, has the fewest jobs ready. Though such a region is not necessarily the one with the fewest users assigned to it, it should impose the least contention and provide better response time.

If users are fairly stable and repetitious in their use of the system, the DECAYACT parameter – which determines average region activity only on activity recorded since the last logon – may be useful. Otherwise, Deese warned, it may dump many jobs into the same region. Some users have modified this algorithm so that wild imbalance of user loads between regions is controlled.

UK's NCC Plans CPE 'Exercise'

MANCHESTER, England – Are the various measures of computer performance which can be constructed useful? Is it practical to collect data on a sufficiently uniform basis so performance can be validly compared across a wide cross-section of user environments? What are the problems in collecting and recording data?

A "small, informal working party" organized by the UK's National Computing Centre (NCC) here hopes to find answers to questions such as these through a computer performance evaluation (CPE) "exercise" expected to get under way shortly.

According to an article in a recent issue of the quarterly *NCC Interface*, much of the groundwork for the project – identifying types of data to be collected and defining terms to be used and suitable measures of various aspects of performance – has already been completed.

Actual collection of data – the exercise itself – will probably last about a year. Performance statistics or participating user installations will be collected, analyzed and distributed at regular intervals to those involved, *Interface* added.

A review of the exercise results at the end of the first year will determine if it is to continue. If the project gets a go-ahead at that time, the NCC may then decide to make the monitoring approach developed in the exercise an ongoing service available to the NCC membership as a whole, the article said.

The Datapoint Diskette 1100–Lets You Enter the Profit Making World of Dispersed Data Processing

Now you can enter the profit making world of dispersed data processing with Datapoint's Diskette 1100 System, a combination of computing power and data storage designed to meet critical requirements for business data entry and data processing applications.

The Diskette 1100 combines a powerful business-oriented computer with 16,000 characters of fast memory and a rapid yet inexpensive flexible diskette data and program storage facility. And, since it's a Datapoint, it has the same operator-oriented styling and features including a wide, clear video display and typewriter and numeric keyboards that have made Datapoint dispersed processors "workhorse" data entry and processing stations in thousands of organizations.

The System's integrated Diskette unit offers on-line storage for over one million characters through the use of up to four diskette drives. Each diskette can hold up to 256,000 characters of data or programs with an average access time of approximately 80 milliseconds.

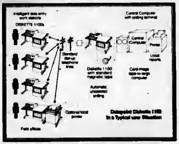
This capability puts bottom-line performance where it counts – at the disposal of the people who really need computer power. Here are some of its operational advantages:

1. FAST FORMS RETRIEVAL – Almost instantaneous form display for data entry tasks – through form retrieval off a Diskette and then a high-speed display on the screen. You simply select your form, hit a button and zap – it's there. Result: Higher operator productivity, less waste.

2. FLEXIBLE LOCAL FILE CAPABILITY – Now a local office can create, access and maintain files on locally entered data plus other useful files such as duplicate home office master files. All files can be sorted, edited and locally printed out. Result: Local personnel stay in closer touch with relevant business situations.

3. LOCAL DATA PROCESSING – The computer's power permits data to be processed by use of a number of high-level languages; DATABUS, RPG II or BASIC, saving home office computer time and providing timely local reports. Remember that data files on the diskette are compatible with all Datapoint programming languages – no need for complex conversions.

4. EASY COMMUNICATIONS – No need for expensive communication programming development. Our DATAPOLL package offers simple to use yet powerful communications between a Diskette 1100 and home office Datapoint system. Dialing and answering are automatic over standard telephone lines. If communications with a large computer are needed then a suitable emulator can be selected from among those available for most standard main frames.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Say CRT Really DP Equipment

IBM, Cbema Tell FCC Not to Tariff Bell Dataspeed 40

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – IBM and the Computer Business Equipment Manufacturers Association (Cbema) have told the Federal Communications Commission (FCC) that AT&T's Dataspeed 40 CRT is a data processing system that should not be tariffed by the telephone company.

Both IBM and Cbema responded to interstate tariff changes filed by AT&T that covered the clustered synchronous versions of the Dataspeed 40 system. Bell had proposed to initiate the new interstate rates on Dec. 18, but the effective date has now been suspended until Jan. 18.

"It is clear the Dataspeed 40 is data processing equipment which should be provided solely on an unregulated basis," IBM told the FCC. "AT&T has for many years been offering its terminal equipment in competition with the terminals of IBM and other non-carrier" suppliers. And these have been used "as an integral part of computer systems to perform data processing functions," IBM said.

The basis for complaint by both IBM and Cbema is an FCC decision governing the separation of DP and communications services. This decision, an outgrowth of the commission's Computer Inquiry, restricted common carriers to providing services which are primarily communications with only incidental DP portions.

In its comments, IBM said the Dataspeed 40 system is primarily a DP offering for the use of customers with their mainframe and data communications systems.

"The primary – and possibly sole – contemplated use of the Dataspeed 40 terminals is to provide remote access to the CPU of the customer's computer," IBM said.

Violates Consent Decree

Another complicating factor cited by IBM was the 1956 AT&T Consent Decree between the Justice Department and Bell prohibiting the phone company from providing services which are not strictly related to common carrier communications. Because of its DP aspects, the Dataspeed 40 violates this Consent Decree restriction, IBM charged.

"We believe the commission should seek modification from the Department of Justice so as to make perfectly clear that AT&T may continue to offer its terminal equipment for use as part of data processing systems on an unregulated basis," IBM said.

In its filing, Cbema said the AT&T proposed tariff for the Dataspeed 40 terminal system covers "a significantly different type of terminal equipment apparently encompassing far more extensive data functions than terminal equipment heretofore offered by AT&T."

The functions provided by the synchronous versions of the Dataspeed 40 [CW, Nov. 12] were designed to operate as part of a data processing system, the association contended, and "have little or no utility as part of a common carrier communications system."

Among the DP functions cited by Cbema were Dataspeed 40 program access keys "governed by the software in the customer's computer," display buffer addressing and format control. The synchronous clustered CRTs include such functions "in significant measure," Cbema said.

Both IBM and Cbema said AT&T had not provided sufficient information to fully evaluate the capabilities of the clustered terminal system. In addition, Cbema said AT&T had not provided sufficient cost data to accurately evaluate whether Bell had proposed equitable tariff rates for the equipment.

Another organization which objected to the AT&T tariff was the Computer Industry Association. Under the current timetable, AT&T was scheduled to provide its reply comments by Jan. 9.

The Common Carrier Bureau staff is also studying the impact of the Bell terminal system, but a staff source said it had not been determined whether the Common Carrier Bureau would also issue a position paper in the proceeding.

DB/DC Design – Part 1

Generalized Communications Software Does Exist

By Charles St. John Smith Jr.
Special to Computerworld

This article is the first of two which describe a generalized data base/data communications design. Similar systems are now operating at several Burroughs user sites in the Philadelphia area.

In the recent rush to implement data base/data communications (DB/DC)-oriented information systems, it appears the proverbial wheel is being reinvented by each new implementor.

The DB/DC environment may be a "Topsy-like" outgrowth of an existing inquiry system or it may come from a study group complete with data base administrator, but it probably did not come from looking for a generalized approach in established, successful DB/DC systems.

Experience has shown, however, that a successful generalized DB/DC design does exist. This generalized system consists of:

- A network control program (NCP).
- Message control system(s) (MCS).
- Transaction processing programs.
- Data base handler(s) (DBH).

The functions of each portion of the system are well defined, self-contained and nonoverlapping. A hardware configuration which would reflect the distributed nature of this design would have the NCP executing in a front-end data communications processor which has local memory, the MCS and transaction programs executing in the main CPU and the data base handlers executing in an independent input/output processor.

The NCP acts as an extension of the hardware and has in fact been implemented in firmware on "soft" processors. It has the responsibility for handling all line and terminal disciplines, message reception and assembly, message disassembly and transmission, notifying the appropriate MCS a message has been received for processing, accepting notification from an MCS of a message to be transmitted.

It also attaches and uses control information relative to each message such as associated station, character and string count, station message number, system message number and time stamp.

Thus, the NCP is concerned with the physical characteristics of the data communications network, and changes to the network would be reflected solely in this module.

It is expected that the NCP consists of a table-driven group of overlayable routines, so that memory usage is minimized, and changes to a network require only changes to the tables of lines and stations.

The MCS analyzes messages received from both the NCP and transaction programs to determine, based on the contents of the message, what action to take on that message.

Normally, a message from the NCP will be routed to a transaction program, and a message from a transaction program will be routed through the NCP to a terminal.

It is possible, however, to route messages from one transaction program to another, and from one terminal to others, either immediately or via some queueing mechanism for later delivery.

The MCS should have message routings in a table, with one entry for each transaction type. This would allow dynamic addition, deletion or modification of message routings, with no changes being made to MCS code.

Auditing of messages by type, by direction, by sender and/or receiver would be handled as a function of the MCS.

Transaction processing programs form the heart of a DB/DC system. Messages are passed by the MCS to a transaction program for processing, and, if appropriate, a response is returned to the MCS.

Each transaction program should process one request and should be independent of other transaction programs. Requests for information concerning elements of the data base are not handled directly in the transaction programs, but are passed to the DBH for action.

If successful, the requested action has been taken, and appropriate data is returned. If not successful, the result status will indicate the cause of the failure, such as:

- Requested record was not found.
- Record exists, and duplicates are not permitted.

The transaction program needs only to test for exceptions which could be caused by the particular data base request it issued, not for all possible exceptions.

Because both requests and responses are generated programmatically, by using fixed formats the programming effort will be lessened.

Transaction programs should be comparatively small, as they will normally contain only specialized processing code, input and output message space and space for a requested data set member.

The data base handler is in control of all accesses to the data base. To prevent corruption of the data base and to ensure the validity of any auditing of requests, no other programs should be allowed access to the data base.

Auditing of messages and preparation for data base recovery can thus be localized in the data base handler. Since only one program is allowed to access the data base at any point in real time, record lockout, deadlock protection and resolution of a "deadly embrace" can be handled once for all applications.

Upon receipt of a request from a transaction program, the DBH does the requested action, generates a result status and returns the status and appropriate data to the requester.

Interface between programs should be through asynchronous queueing mechanisms, with a typical entry consisting of the message, sender identification and receiver identification.

Smith is branch systems manager at Burroughs Corp. in Philadelphia, Pa.

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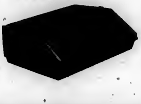

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NCR Electronic Cash Register Designed for Lodging Industry

DAYTON, Ohio – An electronic cash register designed primarily for hotel and motel use has been introduced by NCR Corp.

The NCR 250-8000 is a free-standing, programmable transaction-control and information system designed for the lodging industry, according to a company spokesman. It offers capabilities that approach on-line or minicomputer-based systems, he said.

Features like room-rate lookup, phone-charge extension, tax calculation and error-free pickup of balances from the generation of a check digit help hotel or motel management keep accurate records, he added.

Instructional panels, color-coded keys and a 10-key pad also help customer processing and reduce front-desk bottlenecks during peak periods, he said.

In addition, two special keys on the 250 make it possible to transfer amounts from one control account to another, the company said.

A clear audit trail is preserved through cashier identification keys, sign-in codes, totals for paid-out transactions and other protective functions.

Purchase price of the 250-8000 is $4,995 plus installation and programming. It is available for immediate delivery, NCR said here in Dayton, 45479.

Lenkurt Data Set Bell 208B-Compatible

SAN CARLOS, Calif. – GTE Lenkurt, Inc. has introduced a 4,800 bit/sec data set that it said is end-to-end compatible with the Bell 208B.

Called the 262B, the data set enables dial-up direct access to the switched telephone network. The unit transmits and receives synchronous serial binary data in either half-duplex or simplex modes of operation over two-wire lines.

The 262B is end-to-end compatible and electrically interchangeable with the Western Electric 208B data set and conforms to EIA Standard RS-232C and CCITT Recommendation V.24.

The data set has an automatic adaptive equalizer which continuously compensates for delay and amplitude distortion introduced by the transmission facility. Training time to achieve equalization is said to be less than 50 msec.

Automatic answering of incoming calls is provided by switch selection. Alternate voice/data operation and manual call origination can be provided. Type 801 calling equipment can be used to provide automatic call origination.

The unit costs $3,750 from the company at 1105 County Road, 94070.

OEM Micro-Based Terminal Can Be User-Customized

HAMILTON, Ontario – A microprocessor-based OEM video terminal that can be "customized" to meet the needs of the user has been introduced by Westinghouse Canada Ltd.

Called the W1625, the terminal transmits up to 9,600 bit/sec and is designed to accommodate a wide selection of plug-in components, circuit boards and peripheral devices.

Programs are stored in customer-masked read-only memories (ROM) which modify such operative characteristics as communication protocols and peripheral control.

The terminal can also incorporate user- or vendor-programmed programmable read-only memories (Proms) to meet various application requirements. The W1625 costs about $3,000. The firm's address is Box 510, Hamilton L8N3K2.

ICC Adds Support Policy

MIAMI – International Communications Corp. (ICC) has announced a customer support policy that will eliminate most field service charges on data communication products installed by ICC.

The service policy applies to customers who ordered equipment after Sept. 1.

Customers who purchased equipment will receive support services during prime shift hours at no additional charge for a period of six months, ICC said.

ICC products covered by the policy include high-speed and medium-speed modems, the 40+ data display system, test equipment, technical controls and accessories, ICC said from 8600 N.W. 41st St., 33166.

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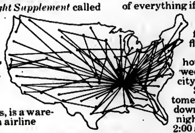

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For Off-Line Use

NCR On-Line Users Get Self-Service Banking Terminals

DAYTON, Ohio – Financial institutions using NCR Corp.'s on-line data centers in the U.S. are now able to install NCR 770 self-service banking terminals through a service recently introduced by the company.

The data centers have offered the service on an off-line basis, according to a company spokesman. The data centers will also provide on-line processing services for 770 terminals by the third quarter, the spokesman added.

The service can be used by financial institutions now on-line to NCR data centers for the processing of many types of customer transactions, NCR said. Data from the self-service financial terminal's journal tape is manually entered into the data center system through existing on-line terminals at the user location, it said.

The center processes the information and provides the user with daily activity reports and quarterly summary reports. Although entered through another terminal, the transactions are identified as originating from a self-service terminal, the company added.

The centers can provide magnetic tapes containing all the account information needed for encoding and embossing customer cards. The centers can also establish secret numbers for each customer and provide printed or microfiche listings of the numbers, the spokesman said.

In the off-line mode, the 770 terminal maintains a "hot card" file capable of holding 500 card numbers. Should someone attempt to use one of these lost or stolen cards, the terminal can either reject or capture the card, he added.

On-line processing for the 770 terminals will provide real-time account updating; the status of an account is reviewed automatically for every transaction, the company said.

In addition, customers will be able to make inquiries through the terminal concerning the status of their accounts, it added.

Communications Failure

In the event of a communications failure, the 770 can automatically switch to off-line operation and remain in service. In that event, transactions are recorded on a magnetic tape cassette and later transmitted to the central computer when communications are restored, NCR said.

Messages concerning abnormal conditions in the self-service terminal are automatically sent to a terminal in the home office so the bank can be alerted to any problems.

Additionally, the bank can inquire about the status of any self-service terminal in the network through a home-office teller terminal, it added.

Costs for the data center service are 1 cent per account per month, the spokesman said. Initial, one-time costs include $150 for program conditioning to meet customer specifications and a 10 cent/card charge for initial file setup, he added.

Costs for the 770 range from $18,000 to $30,000, NCR said from 45479.

Communications Tests Automated in Canada

TORONTO – A computerized system which automates data communications test and repair centers has been put into service by The Computer Communications Group of Bell Canada.

Called the Trouble Report & Information Handling System (TRIHS), it uses Vucom 1 CRT terminals linked to a minicomputer containing a data base of customer circuit layouts and histories.

The system centralizes record storage, provides multiple access to the records, generates system and customer analysis reports for management and automates many clerical functions.

TRIHS controls trouble reporting, testing and repair service for all Bell Canada's data communications offerings terminating in the area. This includes TWX, Datacom, Vucom, Faxcom and Telescript terminals.

TRIHS reportedly does away with the thousands of pieces of paper, such as trouble report tickets and circuit layout and history cards, which previously were circulated manually around the center.

The attendant receiving a trouble call has a Vucom 1 CRT terminal. While talking to the customer, the attendant can immediately call up on the CRT screen the customer's circuit and history record from a central data base.

This data base is the heart of TRIHS. It contains 15,000 customer records and the capability to store over 100,000 records. These records are stored on high-speed disk memories accessed through an advanced minicomputer.

Action to clear the trouble begins with a check of the circuit layout, analysis, remote testing and, if needed, the dispatching of a repairman to the site. Once corrected, appropriate details are fed back into the computer as part of the circuit or service history.

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Front-End Processor Improves Bank's Customer Service

NEW YORK – At Lincoln Savings Bank here, a front-end communications processor serves as a "traffic cop" between branch teller terminals and the bank's centralized DP facility.

This on-line capability reportedly provides Lincoln with improved customer service and minimizes overall transaction time at the main office and its 11 branches throughout the New York metropolitan area and Long Island.

The Periphonics T-Comm 7 front-end processor assumes the communications burden as well as control of remote IBM 2980 terminals. This was formerly the responsibility of an in-house IBM mainframe.

Freed of this workload, the CPU is now operating without the interrupts so common in the teleprocessing environment.

Lincoln averages 4 million transactions per year through 75 teller terminals covering deposit accounts, certificates of deposit, club accounts and other conventional savings bank services.

The initial step from manual to DP operations was taken some 17 years ago, when NCR paper tape terminals were installed in the branch offices. At the end of each banking day, the punched paper tape was sent by messengers to the main office where it was transferred to magnetic tape or punched cards.

Time Delay

Besides all of the problems associated with torn tape, error checking, proofing and the cumbersome transfer of funds between accounts, this early system engendered a significant time delay in the bank's overall operation.

Tapes were not delivered on time, some had to be rekeyed and held until the CPU was available. This resulted in significant time lapse and expense, yet was necessary to ensure that discrepancies did not exist between the bank's master files and customers' passbooks.

In 1968, the expansion of the bank's branch operations presented logistical concerns on the part of management. The timely movement of information throughout the bank took on increased importance. The situation required attention to prevent a future situation which could impact growth.

Overcoming existing systems limitations, preservation of data base integrity and elimination of conditions which interrupted daily activities were the factors related to automation procedures. Obviously these factors had to be weighed to ensure customer service.

Henry Pieron Sr., vice-president and data processing officer, and Howard M. Hoeberlein, executive vice-president, headed an evaluation of the bank's information needs, with particular focus upon the benefits to be derived from an on-line system.

Feasibility studies were undertaken and systems evaluated over a two-year period. The decision was made to upgrade to an on-line operation.

An IBM 360/40 was selected which included four tape drives, eight disks and 256K core capacity.

The 75 IBM 2980 terminals with direct computer access were installed and operational by mid-1971. The 2980 accepts passbooks, creates journal tapes and updates customer files.

Monitoring System

In addition, an arrangement had to be designed into the initial on-line configuration to permit DP personnel to monitor, test and isolate terminal and communication facilities malfunctions. It became necessary to back up the private lines to the branch terminals with dial-up capabilities.

Once fully implemented, an assessment was made by Pieron of both the hardware and software aspects of the system to determine what modifications would be necessary to accommodate increased transaction volume resulting from new services.

During this assessment period, Lincoln Savings began its discussions with Periphonics, which led to the selection of T-Comm 7.

By early last year, the Periphonics front-end processor, with a Digital Equipment Corp. PDP-11 and two interfaces to the IBM CPU, was operational. T-Comm 7 supports 12 communication lines which link the terminals to the DP center.

In addition to eliminating the CPU "hand-shaking" requirements, terminal polling and other on-line demands, the front-end contributed to the faster transaction processing, thereby expediting customer services, especially during peak periods of banking activity, Pieron said.

Remote Terminal Testing

An important capability of the T-Comm 7 enabled Lincoln's DP personnel to perform testing of the remote terminals to isolate problems. During day-time operations, the system provides the ability to transfer any branch terminal from the main on-line system (an IBM 370) to the back-up IBM 360, without interrupting normal operations.

Prior to this capability, DP personnel had to do their program testing in the early hours of the morning before the bank opened.

Now there's a family of distributed data entry and processing systems that you can tailor to the requirements of your remote sites.

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Using our Sycor Models 340, 350 and 440, and their wide range of peripheral equipment, you can pinpoint capability to site requirements and price.

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The Model 340.

For smaller office situations that call for data entry, you'll find our Model 340 the low-cost intelligent answer.

No matter which of its hundreds of applications you use it for—like order entry, payroll and accounts payable—you're assured of virtually error-free data every time. Because operator errors are pointed out immediately for on-the-spot correction.

And, its 8k bytes of programmable memory and capabilities like customized field validation, conditional data entry and arithmetic operations, mean the Model 340 goes even further in providing for needs you might not even have anticipated when you first got it.

The Model 350.

If you need the advantages of random accessibility, look into the Model 350. The 500,000 "fill-in-the-blanks" characters on its exclusive dual flexible disks let you store customer, product/price and salesman files right at the source.

And, with its 16k bytes of programmable memory, the Model 350 not only retrieves data, but maintains and updates files—and even generates reports.

Just key in a customer number and you get all the pertinent data: name, address and billing information. That means reduced keystrokes, improved accuracy and big savings.

The Sycor 440 System.

When you need more than just data entry, look into our new Sycor 440. With a disk storage capacity of up to 10 million characters and the use of up to eight separate terminals, you can do data entry and inquiry/response concurrent with background processing.

Our 440 system lets you share and access files locally, reducing communication line costs and investments in central CPU resources.

Each display is controlled by the on-site processor and is capable of performing independently. At the same time that you're performing data entry you can make use of our special programs to produce a wide variety of management reports like sales analysis, inventory and billing.

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Interface Allows CDC Printer Use

MINNEAPOLIS – Control Data Corp. has an asynchronous communications controller interface that allows use of the CDC 9316 matrix printer in OEM receive-only remote communications terminal applications.

The interface connects to standard EIA RS-232C or CC ITT V24 modems or a serial input/output port, assembles asynchronous serial data into 5-bit to 8-bit parallel characters and performs single-bit parity error checking. It then transfers error-free characters to a standard 132-character print-line buffer or optional 1K-word buffer memory.

The receive-only controller interface handles eight switch-selectable transmission rates of 150 bit/sec to 9,600 bit/sec, and the reverse channel line is sampled by the data sources to determine when a "three-fourths-full buffer" data condition exists at the interface.

Price for the interface is $300. Deliveries of printers including the controller interface are scheduled 90 days after receipt of order.

The CDC 9316 is priced at $2,350, and is available in 90 days.

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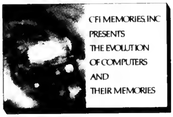

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Shifts Data Entry to User

OCR, 3740s Make for Cardless 370/125

Special to Computerworld

NEW YORK – Concord Fabrics, Inc., a textile converter here, has implemented cardless, tapeless data entry to its IBM 370/125 computer using a combination of Cognitronics Corp. optical character recognition (OCR) and IBM 3740 key-to-diskette equipment.

The approach, adopted long before IBM endorsed or announced cardless disk entry, has saved Concord nearly $1,000/mo in equipment costs, with substantial clerical reductions.

It has increased data-entry accuracy and throughput and shifted responsibility for a high percentage of input to users in the sales, merchandising and accounting areas.

The basic elements in the multimedia system approach are Cognitronics System/70 OCR, IBM 3740 key-to-diskette equipment and an IBM 370/125 CPU with 3270 CRTs and disk storage.

OCR is used for retail order entry, file updates and application of cash in the accounts receivable application.

Key-to-diskette is used for billing and data communications between the firm's New York headquarters and its Georgia plant, including the reporting of finished goods production. Concord uses the 3270s for certain on-line order-entry and inquiry functions.

Prior to the full cardless, tapeless approach, the company had a card reader and tape drives on the 370/125 as well as a battery of keypunches for input preparation.

Less than three years ago, Concord used a card-oriented 360/30. Since then Concord has grown some 60% to sales of over $80 million.

A 370/125 was installed in 1973 to handle growth and support new applications. Shortly afterward, the firm installed the Cognitronics System/70 OCR and key-to-diskette equipment.

User Responsibility

"Our intent was to eliminate card handling and eventually run a cardless, tapeless System/370," according to Tom Karcher, corporate systems director. "Our major goals were not only grester accuracy and data throughput, but a shift of input responsibility to the user.

"With this OCR system approach, we have achieved those goals at a substantial savings. In effect, we have a lot more computer power for less money, saving close to $1,000/mo in hardware costs.

"In addition, we are doing the work with fewer people. To handle our present volume on the old system would take a minimum of 30 people in I/O control and key entry, as compared with the 11 we have now."

The major OCR application is retail order entry, "the best place to begin," according to Karcher. Concord processes some 1,500 to 2,000 retail orders a week – each about 10-line items – from over 5,000 retail customers, primarily fabric shops, department stores and chains.

Retail order entry is somewhat decentralized and quite applicable to OCR. At present, over 30 people are trained to use OCR, with four entering retail orders on forms specially designed for handwritten input and processing on the OCR equipment.

The procedure is simple and easy to learn. Product equivalency and other codes are preprinted on a standardized form. In most cases the user merely enters customer account number and quantity ordered.

Elsa Brischetto removes diskette output from the Cognitronics System/70 optical character recognition (OCR) system at Concord Fabrics, Inc. Through the use of OCR and key-to-diskette equipment, Concord has cardless, tapeless data entry to its IBM 370/125.

The input is fed to the System/70 OCR; the output is a compatible diskette for 3740 entry to the computer. The System/70 edits certain fields for validity and displays any unrecognizable characters on a CRT screen for operator identification on a typewriter-like keyboard.

The full facsimile display of the data allows Concord to key in any kind of alphanumeric message such as the special instructions that appear on about 10% of the orders.

"With OCR, we are getting data into the computer much faster," Karcher said. "Before we were always a week behind.

"At best we got 180 orders a day from three operators. Now we can process 1,500 to 2,000 orders in six hours work. An order entered today could be shipped tomorrow."

'Datavan' Mobile Service Unit Cleans and Tests Users' Media

By Patrick Ward
Of the CW Staff

TARZANA, Calif. – The "Datavan" is a mobile service and sales facility that cleans and evaluates tapes and disk packs or reinks ribbons for users who aren't large enough to justify having their own cleaning and reinking equipment.

A Datavan serves 45 users in the Los Angeles area and will be joined there by four more vans in the third quarter, a Datavan spokesman said.

Besides servicing the user's media, the Datavan driver/operator will also sell Memorex media and supplies.

Memorex has loaned money and supplies to Datavan Corp. and will soon invest in the company, a Datavan spokesman said.

Products Sold

The products being sold on the van include printer ribbons, magnetic tapes, disk packs, cartridges and floppy disks, plus other supplies and accessories.

A Datavan rolls around to a customer site about every two weeks. The customer determines the exact time and schedule.

Datavan Corp. calls the customer one day before the normally scheduled visit to determine the services the customer needs performed or the products or supplies required.

Specifically ordered products are then taken from Datavan's warehouse and put on the van at night prior to the next day's run.

At all times the van will carry a large assortment of more commonly required supply items so the customer's needs can generally be met, even if a specific item wasn't ordered when the van arrives, a Datavan spokesman said.

At Doorstep

The Datavan drives to the customer site and parks at the user's doorstep while performing the services and/or delivering the ordered supply items, the spokesman said.

The vans are fully equipped, self-contained and do not require an additional power supply.

A Datavan spokesman said it is too early to tell when the concept might extend beyond the Los Angeles area.

Datavan can usually refurbish ribbons, tapes and packs and have them ready for reuse within an hour, the spokesman said.

Datavan is at 18324 Oxnard St., Suite One, 91356.

Printer Links to HIS 600, 6000

LONG BEACH, Calif. – Honeywell 600 and 6000 series computer users can obtain an 1,800 line/min printer from Macro Products Corp. at a price a third below the 1,000 line/min Honeywell PRT 201 printer system, Macro Products said.

The 470G system offers both upper- and lower-case printing. Its controller plugs directly into the Honeywell computer's common peripheral interface, a spokesman said.

The printer includes 136 print positions, static eliminator, quietized cabinet and standard Honeywell 64-character print drum, the company said.

The printer's 12-channel vertical format tape unit offers vertical format control compatible with the Honeywell PRT 201 tape formats, Macro said.

The Macro printer can be ordered with either 1,800 rev/min or 1,200 rev/min drum speeds. Or it can be specified for switching between both drum speeds.

The printer system costs $41,600 or leases for about $900/mo on a multiyear contract along with a maintenance contract at $295/mo.

Delivery is 90 to 120 days from the firm at 3110 E. Willow St., 90806.

Tape Copier Writes Ansi Labels

SUNNYVALE, Calif. – Recortec, Inc.'s computer tape copier is designed for writing Ansi standard header labels on 1,600 bit/in. magnetic tapes, according to the firm.

The equipment is designed for use off-line by semiskilled personnel, the company added.

The device can copy and verify any 1,600 bit/in. tape, clean and verify 1,600 bit/in. tapes from archival files or from outside tape sources, clean and evaluate tapes and clean and rewind tapes with or without data.

The unit performs header writing automatically, assigning sequential tape numbers once the operator enters the initial tape number.

The unit costs $24,750 from the firm at 777 Palomar Ave., 94086.

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alphanumeric [illegible]
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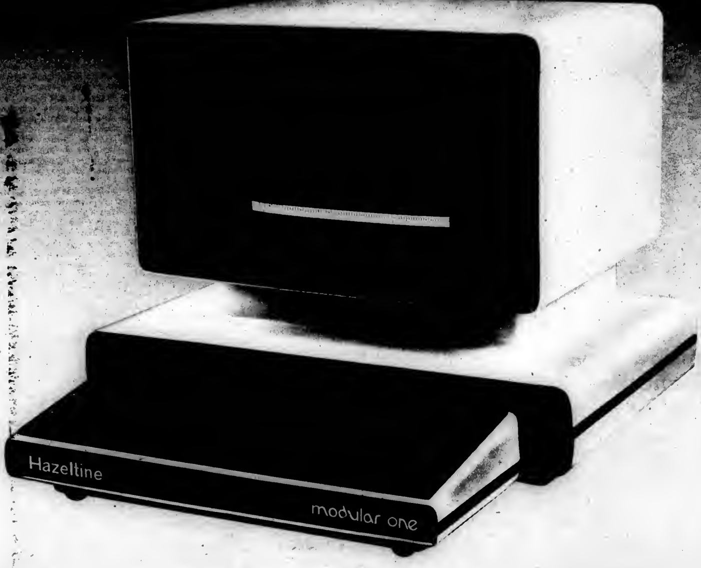

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In Labor, Hardware, Supplies

Key-to-Disk Saves Service Bureau $70,000/Year

By F. Michael McCafferty
Special to Computerworld

CHICAGO – Robert F. White & Co., a service bureau here, has saved over $70,000/year in labor, hardware and supplies since it switched a phone-in payroll data-entry application from keypunches to key-to-disk.

The key-to-disk equipment allows our client representatives to key in the payroll data and have it edited and balanced while the client is still on the phone.

Before we converted the application to key-to-disk in 1974, operators wrote down the phoned-in information on time sheets. This data was then keypunched, edited and balanced in several subsequent steps before it reached the computer for check printing.

White & Co. specializes in batch-oriented accounting services, with payroll the major part of its business. While we found a delivery service a satisfactory means of getting work to and from larger clients, pick-up and delivery proved to be expensive for smaller clients with 15 to 50 employees.

Now the firm has almost 1,000 clients that provide their payroll data by phone on a regular basis.

Previous Method

With the old method, the phone-in clients called a central phone number and this rang in the pool of eight phones. Any of eight control clerks would answer the phone and take the payroll information from the client by handwriting the information on time sheets.

From this point, the completed time sheet would be forwarded to a section where clerks would add the figures to establish control totals, which they posted to the time sheet.

Then the time sheets were sent to the keypunch department. Using IBM 129s, the information would be keypunched only, not verified.

The cards were then run on the shop's IBM 360s to generate an edit-and-balance listing. This balance listing generated totals of the keypunched data. The totals from the balance listing were then visually checked with the totals on the original time sheet by a separate group of control clerks.

If any difference was found due to an incorrectly punched card, the control clerk would write up a transmittal sheet containing all of the correct as well as the changed data on the original error card.

These correction cards were then keypunched (and verified this time) and then forwarded to the unit record room where an operator would sort and then merge the correction card into the file and kick out the error card.

At this point the file was ready to make payrolls and was forwarded to the 360s to calculate gross-to-net, print journals, checks and so on.

After solidifying the concept of what we wanted to do and drawing it all out on paper, we started talking to hardware vendors.

The Entrex 480 was chosen over other key-entry equipment because we felt it was more operator-oriented.

As an incentive for the payroll clerks to accept and work with the new system, we told them before conversion that, if the project was a success, they would be promoted to the new position of "client representative" and given a significant pay increase.

We wrote detailed training manuals for the client representatives so they could study them before installation. Two representatives each week were converted to the system over a four-week period. The conversion went absolutely without a snag.

Each client is now permanently assigned to one of six of our client representatives. A note was sent to each client introducing its specific client representative by name and mentioning that the client representative would be calling the client each week at a specific time of day to take down the payroll information.

This one step had the following effects:

- Allowed us to give more personalized service, because, within a few weeks, the client and our representative became very familiar with each other's procedures and idiosyncrasies.
- The client representative now spends time training the client in ways to make the process easier, because now the representative has a vested interest in his own clients.
- We were able to clearly identify for the first time the productivity and accuracy of each clerk.
- Because of the above, our error rate has dropped dramatically.

Since we now call the client instead of the reverse, the constant phone ringing in our office has been eliminated.

Next, the entire method of recording the payroll data was changed. Instead of handwriting the information on the time sheet and going through the other nine steps from establishing control totals to final correction writing, the representatives now key the information directly into Entrex key-to-disk terminals.

It was possible to eliminate these steps because they were all required solely to make sure that what we made machine-readable was what our representative wrote down on the time sheet.

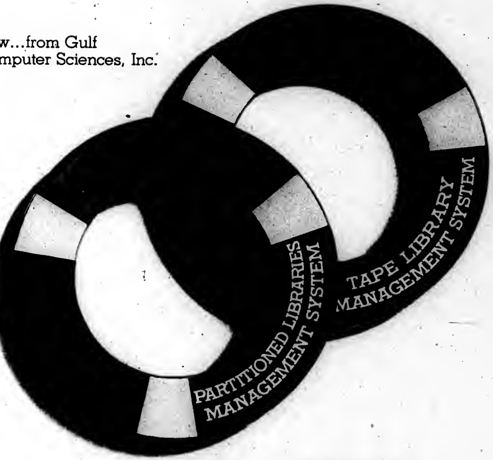
Accuracy in some cases is improved due to programmed range checks, reasonableness checks, check digits, etc, which catch errors before the next employee's information is keyed.

The key-to-disk system allows us to take phone-in payrolls right up to 5 p.m., where before, because of all the additional required steps, we had to stop taking phone-ins at 2 p.m.

Since the key-to-disk system can automatically give us control totals at the end of each client's work, we can now balance to a client's control totals if any are given.

Total dollar savings, after subtracting the $2,500/mo for the Entrex system, is about $70,000/year at our present volume.

McCafferty is vice-president of Robert F. White & Co.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DP to Boost Swedish Telecommunications Efficiency

Special to Computerworld

VASTERAS, Sweden – This country hopes to improve the efficiency of its national telecommunications company by automating much of the order entry and other administrative tasks that are now handled manually.

Sweden's telecommunications company is responsible for the telex, data transmission and radio/television networks in addition to telephone services.

Administration is centralized, though day-to-day matters are handled at four regional centers that serve 20 local areas.

The computer project now under way is known as Telecommunications Administrative Datasystem (TAD). As its name indicates, it relates primarily to the nontechnical aspects of the organization's operations.

Begun in 1968, it is split into six separate phases that will be implemented successively over the next few years.

TAD 1

TAD 1 is concerned with the subscriber and local network system.

Its object is to computerize manual routines now used to deal with orders for normal subscriptions (such as new telephones and removals of existing ones), the ordering of plant installation work required at the subscriber's premises in the network and at the exchange, and the updating of associated files.

It will also include a system for the allocation of vacant numbers.

The other five TAD phases cover the billing, directory printing, payroll, stores control and the major and local network systems.

Here in Vasteras, a town not far from Stockholm with some 200,000 telephone subscribers, the TAD 1 system for vacant-number inquiries is already in operation.

Subsequent steps, comprising routines for accepting and processing orders, recording of local exchange data, extensions to the local network, allocation of pairs of lines and the production of statistical and other reports will be implemented later.

Very Large Data Bases

TAD involves the use of very large data bases, extensive on-line and real-time processing and some exchange of file information with IBM systems already in use for other administrative routines.

TAD runs on a Univac 1110 two-by-two system (two input/output access units and two command/arithmetic units) that was installed at the end of July 1974 after a six-month trial with a one-by-one configuration.

Univac gear was chosen on the basis of the modular design and expansion possibilities of the 1110 system, its communications-handling capability, the local support team and the DMS 1100 data base management software.

The last of these factors was particularly important, since the TAD 1 data base alone will contain an estimated 1,200M characters.

The 1110 has two command/arithmetic units each with 128K bytes of core storage and an operator's console with teletypewriter and video unit; two input/output access units; 25 8440 disk drives and 10 Uniservo 16 tape drives, with each disk and tape unit being accessed through a pair of control units; a Univac 9300 subsystem with two high-speed printers and two card units; and a pair of communications controllers.

At Vasteras, six CRT terminals are already in use for vacant-number inquiries, and ultimately 30 displays, five typewriter and 10 teleprinter terminals will be in operation. Stockholm will use 150 displays, 20 typewriters and 80 teletypewriters.

Data on subscriber orders will be recorded on a display terminal by salespeople during conversation with customers, using the dialogue technique with guide texts.

Where the requirement is for a change to an existing telephone, the operator will call out from computer files the subscriber's address and subscription status along with details of the existing installation.

At this point, he will also be able to arrange with the customer the date of the engineer's visit and whether this will be in the morning or afternoon.

Mistakes and ambiguities in addresses could easily result in later confusion and delay, so the system is designed to eliminate error as far as possible at the time the order is taken.

Through his terminal, the operator can check whether the address given by the customer is sufficient (he might, for example, have forgotten to include an apartment number).

What amounts to a real-time inventory control program will be used to allocate a pair of lines and a number to a new subscriber at the time he places his order.

Information on delivery time will also be available through the terminal. At later stages, it will be possible to obtain details of any shortage of exchange equipment or lines and the date on which the company is planning to remedy these.

The number allocation program takes into account the existing loading on different groups of numbers so that distribution between these will be kept even.

From the customer's viewpoint, the TAD 1 order-entry system will speed and simplify the procedure for obtaining a new phone or altering an existing one.

By the time he has finished talking to the sales clerk, he will know when the work is to be done and, where relevant, what his new number will be.

The system also prints out these details on a contract form which will later be dispatched to him by mail.

The scope of the system will, however, by no means end here. After the order has been recorded at the terminal, the computer will send preliminary data to the directory inquiry service and directory compiling office.

The TAD 1 computer system, as only the first phase of a larger project in course of implementation by Sweden's Telephone & Telegraph Co. over the next few years, will also produce a number of important statistical reports.

By the time TAD 1 is fully implemented, the company expects staffs in the affected departments will be reduced by about 25 people in Vasteras, 240 in Stockholm.

Substantial saving should also accrue through faster cash flow arising from the ability to invoice customers in Vasteras some 14 days earlier than formerly and in Stockholm 21 days earlier.

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The Charaband carries two complete fonts—one on each side.

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It costs less than the 1403.

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How do we do it?

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For less than the competition.

Our 2550 Charaband printer is 1500-LPM proof of that claim.

Interface Compatible

The 2550 can be interfaced with almost every major computer system that requires high-speed performance.

So we invite you to call or write for full information and specs.

Remember, Charaband horizontal-font, 1500-LPM speed, less down time and less money.

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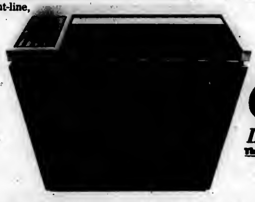

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At Community Hospital

Accounting System Increases Cash Flow by $500,000

By W. Robert Brungard
Special to Computerworld

With costs continuing to rise, a hospital's well-being depends more and more on the efficiency of its business office, particularly from the standpoint of improving cash flow and finding ways to keep costs in line:

Lincoln (Neb.) General Hospital has been unusually successful in this regard with the help of a computer-based accounting system which has provided better control in the business office and upgraded accounting procedures.

Since the system has been in effect, we have been able to reduce our turnaround time in accounts receivable from a previous average of 80 days down to less than 60 days.

Typical receivables turnaround in most hospitals is from 100 to 120 days.

The improved cash flow which resulted from such improved turnaround would make any administrator's eyes light up. In our case, with average daily charges running about $27,000, it means that we have as much as $540,000 more cash available for operating expenses and investment.

Lincoln General is a 282-bed, nonprofit community hospital. We admit approximately 12,000 patients a year and treat more than 17,000 others in our emergency room and outpatient surgical unit.

When we first began to construct computerized medical records and other master files, with the intent to build our own data base accounting and reporting system, we estimated the job would involve nearly 18 man-hour months of our own time.

While this would have been a very costly effort, we felt it was justified in view of the projected benefits.

At about that time, IBM announced its Health Care Support/Accounting System (HCS/AS), which appealed to us for two reasons.

First, it provided a flexible package that would fulfill all of our present accounting and reporting needs, plus it gave us a base upon which to expand into other areas as the need arises.

Second, the package approach allowed us to have a system up and running in about one-third of the time we had projected.

HCS/AS, which provides for inpatient and outpatient billing, accounts receivable, general ledger, cost allocation and on-line inquiry, runs on our IBM System/370 Model 125.

On-line inquiry to the data base is carried out through a group of IBM 3277 CRTs located in the business office and connected to the computer by telephone line.

HCS/AS ties patient billing directly into accounts receivable and to the proper account in general ledger by a one-time entry of charge cards.

All basic patient data is recorded on an admission form which is structured in the same manner as the cards used for entering the information to the computer.

About 90% of our admissions are preadmissions, with the forms prepared using information obtained from patients either by mail or telephone.

Each evening the admission forms, along with any transfer or discharge forms issued during the day, are picked up from the business office and taken to data processing for keypunching.

After information from these forms is entered in the system, the data is used by the computer to generate an updated census, which is printed and distributed to the floors by 1 a.m.

Patient Billing

The data from the admission form also sets up the patient billing file in the system.

The key document in patient billing is a preprinted charge ticket which lists the most frequently billed items and services in the hospital. Each time a charge is incurred, the appropriate item or service is checked on the ticket, which is then imprinted by means of a plastic charge plate containing the patient's name, account number, physician and other pertinent data.

The charge plate is made up and sent to the floor at the time the patient is admitted.

Charge tickets flow into the DP area during the day and are sorted according to the department providing the service (central services, lab, pharmacy, physical therapy, etc.). The information is then punched onto cards and entered on the computer.

The key file used in the patient billing procedure is the charge description master, or pricing file, which contains the item number, price and description for each billable item or service provided in the hospital.

As information from the charge tickets is entered, the computer processes it against the pricing file, applies the correct charge to each service and records it in the patient billing file.

This method of applying charges not only saves the time of hospital personnel having to look up and enter prices each time a charge is made, but also eliminates the possibility of human error which can result in undercharges or overcharges.

As a by-product of the billing run, the computer also produces a daily report listing all new accounts receivable and twice a month prints statements for all 30-day-old accounts.

The cards, which contain the patient account number, category of payment (personal, insurance, Medicare, Medicaid, etc.) and amount owed, simplify entry of payment data to the system.

Each evening the computer processes all payments received during the day and generates a cash receipts and adjustment report detailing all transactions which affect accounts receivable.

The general ledger accounting portion of the HCS/AS provides for automatic input to general ledger of all accounts receivable transactions as they are processed.

Brungard is administrator of Lincoln General Hospital.

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In today's tight-fisted economy the pressure is on every data processing department to improve efficiency and cut costs. That's why *Computerworld* sponsors the EDP Seminar Series - to bring you the detailed information you need in a concentrated, practical form.

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A list of current seminars is given below. To register for any seminar, or if you'd like more information, just check the appropriate box and send in the coupon.

How to Increase Programming Productivity
A 2-day seminar for technical managers on the state of the art of Software Engineering. Led by John W. Brackett, PhD, Vice President of SofTech, Inc., and Clement L. McGowan, PhD, Consultant. Fees: $300, including continental breakfasts, luncheons, and all course materials. $250 for additional registrants from the same company. Schedule:

New York	**Essex House**	**Jan. 26-27**
Chicago	**Hyatt Regency O'Hare**	**March 8-9**

Legal Tools for Computer Contracting and Protection
A 2-1/2 day seminar that shows you how to increase your advantage in dealing with vendors that supply your installation. Includes discussion and review of your own contracts. Led by Roy N. Freed, the nationally known lawyer, author and educator in the field of computer law. Fees: $325, including continental breakfasts, luncheons and all course materials. $275 for additional registrants from the same company. Schedule:

Wash., D.C.	**Marriot Crystal City**	**Feb. 4-6**
Orlando, Fla.	**Sheraton Towers**	**Feb. 18-20**

Performance Evaluation and Improvement
A 2-day seminar on measurement techniques that are designed to save your installation money. Led by Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement and improvement.* Fees: $250 per registrant, including continental breakfasts, luncheons, and all course materials. Schedule:

San Francisco	**Dunfey's Royal Coach**	**Jan. 19-20**
New York	**Summit Hotel**	**Feb. 9-10**

Data Communications Course #1010 -
Practical Data Communications Systems & Concepts
A 2-day seminar on the newest advances in data communications, including SDLC, DDS, new tariffs, equipment characteristics, and the impact of satellite carriers. Led by Dr. Dixon Doll, Teleprocessing consultant. Fees: $350, including continental breakfasts, luncheons, and workbook and reference materials. $300 for additional registrants from the same company. Schedule:

New York	**Essex House**	**Jan. 26-27**
Chicago	**Hyatt Regency O'Hare**	**Mar. 15-16**

Data Communications Course #1020 -
Advanced Teleprocessing Systems & Concepts
A follow-up to course #1010, this 3-day seminar emphasizes techniques that minimize operating costs in commercial data communications networks. Also led by Dr. Dixon Doll. Fees: $450, including continental breakfasts, luncheons, and an extensive set of customized course materials. $400 for additional registrants from the same company. Schedule:

New York	**Essex House**	**Feb. 23-25**

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Note: If time is short, you may reserve space at any seminar by calling collect. Call Miriam Ober at (617) 965-5800.

Bits & Pieces

With Versatec Device

Printers, Plotters Tested

SANTA CLARA, Calif. – The MTE-15 matrix test exerciser from Versatec is said to exercise all functions and options of standsrd electrostatic printers and plotters.

Without tying up a computer or using diagnostic software, the exerciser drives print, plot or simultaneous print/plot functions. It can be used to check serial or parallel data streams, test remote functions and analyze data-dependent problems, Versatec said.

In automatic mode, the exerciser can ask a plotter to output "/" or "XX" patterns or drive a printer through a complete rotating character set. Manual bit-select switches allow output of any character or plot line.

Ten-step switches allow selection of various serial or parallel data rates, line lengths and plot scan lengths. Status lights on the exerciser control panel can be used to test a printer/plotter's ability to answer-back status.

The matrix test exerciser in carrying case with six-foot serial and parallel interface cable, three-wire power cable, fuses and operating/maintenance manual costs $1,350 from Versatec at 2805 Bowers Ave., 95051.

Instruments, Data Collection Units Linked to Data Works Model 1700

CHATSWORTH, Calif. – The Model 1700 dual instrument coupler from Data Works Instrumentation is designed to couple one or two instruments with BCD or binary output to terminals, data collection devices or directly into a time-sharing computer, the firm said.

Output cards are available for teletypewriters, RS-232 devices, paper tape, magnetic tape recorders and IBM 029 card punches.

The Model 1700 is a parallel-to-serial or parallel-to-parallel converter which provides flexible output format, multiple bit/sec rates and the capability to meet the requirements of the most demanding interface requirements, according to the firm.

The Model 1700 is intended for applications in areas such as pollution data recording on paper or magnetic tape, medical data display and recording, addition of timing word to instrument data, development of data logging systems, use of existing instruments for data logging and recording error-free data, the firm said.

The device costs $845 from the firm at 9748 Cozycroft Ave., 91311.

Ansi Reelects President

NEW YORK – John W. Landis, senior vice-president at Stone & Webster Engineering Corp., has been reelected to a second one-year term as president of the American National Standards Institute (Ansi).

Ansi is the clearinghouse and coordinating agency for voluntary standardization in the U.S.

It approves a standard when it receives evidence that all parties having a substantial interest in the scope and provisions of a particular standard have been given an opportunity to cooperate in the standard's development or to comment on its provisions.

Allen F. Rhodes, president and chief executive officer at McEvoy Oilfield Equipment Co., has been reelected to a three-year term as Ansi vice-president.

The other two vice-presidents continue in office; they are Frank J. Feely Jr., vice-president of engineering at Exxon Research and Engineering Co., and Rodger F. Ringham, corporate vice-president of engineering and product environmental quality at International Harvester Co.

Catalog Lists Ribbons Of 60 Manufacturers

ST. JAMES, N.Y. – A 16-page catalog from Computer Ribbon Specialists, Inc. (CRS) is said to list inked ribbons for about 200 machines produced by some 60 DP equipment manufacturers.

The firm is at Building No. 1, Flowerfield, 11780.

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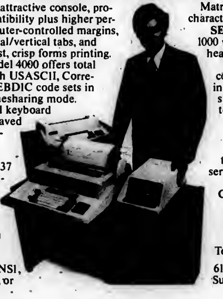

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Key Tronic presents DATAWAND, the handheld OCR system. DATAWAND recognizes eight different character fonts, including OCR-A alphanumeric, MICR, E13B, 1428, and 7B. DATAWAND reads any size form at speeds up to 100 characters per seond and is RS-232 plug compatible.

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ADABAS – the Adaptable DAta BAse System – is a generalized DBMS which supports a network of files using inverted file techniques. ADABAS provides data compression, efficient space management, data protection, data security, and host and self-contained language facilities. Over 60 installations in North America.

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DATAPOINT CORPORATION

Datapoint will show it's line of Dispersed Data Processing equipment. This includes intelligent terminals, small business computers and a multi-user, multi-task business timesharing system.

All these systems will be running typical business processing programs such as source data entry, and inventory control.

wabash

Wabash Tape manufactures and supplies the following full line of magnetic media; i.e., computer tape, disk packs, flexible disks, digital cassettes, disk cartridges, and magnetic cards. Wabash is located in the midwest with offices throughout the United States and in Canada.

TEXAS INSTRUMENTS
INCORPORATED

Texas Instruments will display and demonstrate models of their 990 Family of micro/minicomputers, as well as models of their Silent 700* Electronic Data Terminal Family.

*Trademark of Texas Instruments.

INTERDATA

Interdata, Inc. will display its 16- and 32-bit computers and Carousel printer terminal – high reliability products with performance, packaging and pricing designed to provide sophisticated OEMs and end users with the most cost-effective tools available for their computing needs.

nci

"Considering the price of SLICK and its performance, there's no reason to pay more for a library system." Bob Martin – CHATTANOOGA ELECTRIC AND POWER BOARD.

SLICK, a true price performance source program library system, costs as little as $78.00 per month.

MEGADATA

Megadata Computer and Communications Corporation will show a complete family of products; the new improved "POWERSCOPE" family of intelligent programmable terminals; the bi-lingual, terminal; the text editing terminal; the color display; the terminal used in the banking community; the touch screen terminal; and a number of peripherals such as floppy disks and peripherals.

Atlantic Research will feature:

- Intershake II, Line Protocol Tester Simulator, speeds to 64 Kbps, enlarged memory.
- Cassette recorder and CRT monitor for Intershake.
- Three bay Network Control System, NCS-100 including rack-mounted Data Tek 9600, Intershake and Analog and Digital Patching/access systems.

Consolidated Computer

"CONSOLIDATED COMPUTER will be displaying the new KEY-EDIT 60 key-to-disk system for small to medium sized users. More than a data entry system, KEY-EDIT 60 has powerful editing, processing and communications features to help distribute the data processing workload."

SYCOR INC.

Sycor presents a family of intelligent data entry and processing equipment which you can tailor to the specific requirements of your remote sites – from data entry to communications to remote inquiry/response to on-site report and forms generation.

Holds Line on Costs

System Monitors University's Energy Consumption

BERKELEY, Calif. – Administrators of the University of California here have installed a minicomputer system to monitor the use of about $170,000/mo worth of electrical energy.

The system is helping facility managers here understand exactly where and how power is consumed and how best to reduce this hefty monthly bill.

While itself consuming no more energy than a room air conditioner, the system monitors more than 20M watts of power used in 75 buildings. The Lawrence Berkeley Laboratory is separate electrically and accounts for another 20M watts.

Several Purposes

According to Anthony L. Browne, a university administrator for information systems, the system has several purposes: "The monitoring system will be the tool for future energy conservation, helping us to hold down runaway costs, better maintain the campus electrical system, plan system changes and provide detailed documentation of energy usage."

The system includes a Hewtett-Packard (HP) Series 9600 data acquisition and processing system containing a 2100 minicomputer, two disk packs, high-speed paper tape reader, plotter, CRT and 31 transducers which sense voltage and current flow in the feeder circuits to all the campus buildings.

The computer scans the transducers once per minute to take a new set of readings. These transducers are situated in the central, high-voltage distribution cubicles, each of which supplies a single large building or several small buildings. Signals from the transducers are conditioned by a scaling device and then travel over both campus and dedicated telephone company tines through an analog-to-digital converter before finally arriving at the computer.

In real time, the computer generates displays of energy use in each of the 25 cubicles which are monitored by a console in the plant engineer's office.

The university is using HP's real-time Executive I and writing its own application programs, a spokesman said. One program, for example, creates a continuous beep sound on the CRT when a station is running a higher than average peak and places an asterisk next to that station on the screen.

This displayed data is also stored on one of two disk drives and later plotted offline on an HP 7210A digital plotter, to graphically display patterns of energy use over periods of a day, a week or a month.

A teletypewriter is also available for producing data tabulations and for program development entries and output.

The system cost the school $40,000, including all the software necessary to get it started.

The system examines the two main factors which go into the calculation of the institution's monthly bill – energy demand and energy usage.

Demand represents how much energy the campus may require at any given moment, while the power or energy used is, of course, the summation for a given time period.

High-demand peaks occur at the university when several experimental apparatus such as the main campus' wind tunnel, small nuclear reactors and plasma experiments are turned on simultaneously and superimposed on the ordinary "background" loads such as lighting, heating, cooling and continuously run experiments.

A high-demand peak pays a heavy penalty. To help defray the costs of turbines, generators and transmission lines necessary to meet the highest peaks which may arise, no matter how short their duration, the Pacific Gas and Electric Co. (PG&E) incorporates peak demand into the billing equation very significantly.

In charging for peaks in demand, PG&E employs what is called a "ratchet effect," whereby the highest peak occurring during any half-hour period for the month is carried forward in calculating the next 11 monthly bills or until a new half-hour peak is registered in some succeeding month. This ratcheted peak is averaged in with each month's actual peak.

The system is also capable of monitoring load shutting in the event of an energy crisis.

With economists at the utilities predicting that demand charges will triple in the next several years due to increasing costs of producing clean energy, managers here at this community of 40,000 people are using the minicomputer as a tool to better define realistic conservation programs and better maintain their electrical system.

MCM/700 Mini Supports APL

KINGSTON, Ontario – The MCM/700 from Micro Computer Machines, Inc. is a portable stand-alone system that supports APL.

The 20-pound system is equipped with an IBM 3741-compatible keyboard and 32-character display readout. It can operate from a car cigarette lighter, the firm said.

An enhanced version of the firm's MCM/70, the system can drive peripherals such as printers and plotters, communicate with other systems and function as a remote terminal or entry device, according to the company.

Using magnetic tape cassettes, the system allows its users to develop their own personal librarieis of data and programs. According to MCM, cassettes can also be used to expand the unit's basic 8K-byte user work space to as much as 200K bytes of virtual random access memory (RAM).

The MCM/700 contains an expanded operating system which includes a virtual memory capability and a considerably enlarged APL instruction set, a spokesman said.

A redesigned power fail-safe protection system driven by internal batteries allows the MCM/700 to operate in cases of transient power failures, the firm said.

In extended failures, the system initiates an orderly shutdown of the computer and safely transfers all its read/write memory to the cassette with the directory updated.

Purchase price for the system ranges from $4,970 with 2K bytes of user RAM work space to $9,800 for 8K bytes of user RAM and two tape cassettes from the firm at 133 Dalton St., K7L-4W2.

DPI Has Paper Tape Reader

HACKENSACK, N.J. – A paper-tape reader that can be used with minicomputers and is capable of encoding from operator side of panel by means of transport shaft control knob has been introduced by Data Peripheral, Inc.

Speeds up to 150 char./sec can be achieved. The unit is compatible with RTL, DTL and HTL logic as well as relay systems and costs $160. The firm can be reached at 14 Porter St., 07601.

'Mini' to Sponsor Show on Applications

SAN FRANCISCO – The applications impact of the minicomputer/microcomputer area will be the subject matter of a new conference and exposition to be held in the Brooks Hall/Civic Auditorium complex here Oct. 19-21.

The first annual Mini/Micro Computer Conference and Exposition is to be sponsored by the Minicomputer Industry National Interchange (Mini), a recently formed, national nonprofit organization, with participation by other computer industry associations expected.

At least 12 conference sessions consisting of about 50 papers, a product display of 300 booth units and an audience of 10,000 are expected.

Information is available from Rankin Exposition Management, 5544 E. LaPalma, Anaheim, Calif. 92807.

DP Conferencing Seminar Topic

NEWARK, N.J. – Conferencing with minicomputers, a concept for carrying out written communication among groups of individuals separated by time and distance, will be the subject of a one-day seminar March 25 at New Jersey Institute of Technology (NJIT) here.

The seminar is intended to present an overview of rapidly developing conferencing techniques utilizing minicomputers.

NJIT is currently developing a computerized conferencing system for the National Science Foundation under the direction of Dr. Murray Turoff, who will lead the March seminar.

"Utilization of Computerized Conferencing in Negotiation Processes," will be discussed by Richard Wilcox, chief of military affairs for the U.S. Arms Control and Disarmament Agency.

Irene Jillson, president of Policy Research, Inc. of Baltimore, will present a case study of computerized conferencing for facilitating organizational communications.

The role of the conferencing method in modeling and simulation will be the topic of Professor Julian Scher of NJIT's Computer and Information Science Department.

Turoff will review costs and benefits of computerized conferencing as compared with other communications methods.

Cost of the seminar is $95 per person, the Division of Continuing Education said from 323 High St., 07102.

Ball Floppy Systems Introduced for Novas

OAKLAND, Calif. – The 3190 D dual floppy disk system from Ball Computer Products, Inc. is a complete system enclosure housing two Pertec floppy disk drives and the Ball Model 3190 disk controller.

The system is compatible with Data General Corp. Nova minicomputers.

With the controller logic card included within the chassis, no CPU I/O slot is required, Ball said. This frees an I/O slot for additional memory or another peripheral.

The system costs $4,800 and is available from the firm at 5601 College Ave., 94618.

Save yourself from manual disk conversion For $780.

That's not much to pay for a completely new approach to disk conversion. It's called DOSSIER, for users of IBM DOS and DOS/VS.

What you receive is a semi-automated method for converting existing programs, files and JCL. At a rate of efficiency you might not believe possible.

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Mini Helps Grain Firm Manage Accounting, Inventory

BURLINGTON, Colo. – A grain company here decided it needed a minicomputer to do the books because of accelerated foreign grain trading, a bumper harvest and the fast-changing nature of grain prices.

After evaluating several alternatives, Plains Grain Co., Inc. decided to install an IBM System/32 to "provide the greatest possible degree of precision for grain accounting not only for ourselves, but also for the farmer/stockmen we serve," James Rawson, owner and manager, said.

Instrumental in making the choice was Rod Rawson, son of the owner, who had taken a college programming course.

He examined published evaluations of several business systems, visited a few installations of those under consideration and finally, after the System/32 was installed in July, programmed many of the applications, with IBM assistance.

Plains Grain developed an integrated accounting and inventory management system triggered by the receipt of grain from farmers and other elevators.

When a customer arrives with his grain, clerks operating the company's scales record customer name, type of grain, gross and net weights and moisture or tare (weeds, dirt, other impurities) information.

Later, customer numbers are added and the data entered into the System/32 on the typewriter-like console.

From basic information, the computer calculates shrinkage factors and net weights, converts pounds to bushels and tabulates all relevant accounting and inventory totals.

"We usually have all of a day's activity into the computer by 9 a.m. the following day – even in peak harvesting time," Rod Rawson said.

"Using traditional paper-and-pencil accounting took a half day or more. Sometimes, in peak season, it would be several days before we'd catch up."

On demand, the computer then prints customer tally sheets which show at a glance all transactions in the account, summarized in columns and totaled in a single line, "bushels available for sale."

For management of the elevator, however, having daily transactions in computer-usable form means a perpetual, up-to-the-minute daily position, the firm said.

Summaries show in detail not only what stocks are in the company's elevators, but also complete accounting of storage liabilities – grain held as collateral for loans to farmers, grain committed to dealers, grain owned by the company and sales contract activity.

The system costs the firm $900/mo less, than it would cost to add another bookkeeper, Rod Rawson said.

Intel Micro Kit Preprogrammed

SANTA CLARA, Calif. – Intel Corp. has introduced a ready-to-assemble, preprogrammed microcomputer system kit.

The kit provides a complete system based on Intel's 8080A CPU group and programmable LSI input/output blocks, which allow the system to control and communicate with numerous classes of peripheral equipment.

Called the MCS-80 microcomputer system design kit, it provides the following components and software for $350:

- 8080A central processor unit.
- 8224 clock generator.
- 8228 system controller.
- 8251 programmable communications interface.
- 8255 programmable peripheral interface.
- Two 8205 one out of eight binary decoders.
- Two 8708 8K erasable programmable read-only memories (Prom) (one contains the system monitor, programmed by Intel).
- Two 8111 1K (256-bit by 4-bit) static random-access memories (RAM).
- Clock crystal.
- Printed circuit board.
- Connectors.
- System monitor program.
- 8080 system user's manual.
- 8080 system programming manual.
- PL/M programming manual.

The MCS-80 kit was developed primarily for system prototyping by equipment designers, the vendor said. However, it is also suitable for other users such as engineering school students and computer hobbyists, Intel added.

Features built into the group include: crystal-controlled TTL and MOS clocks, auxiliary timing functions, power-on reset, system bus control, single-level interrupt control and bidirectional bus drive.

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Varian System Processes Nuclear Medicine Data

PALO ALTO, Calif. – A minicomputer-based system for nuclear medicine applications has been announced for U.S. sale by Varian Associates.

The system, called Varicam, uses the V70 minicomputer and was developed in England by Varian Data Machines. It is currently in use in hospitals throughout Europe, the firm said.

The system can accept data directly from most commercially available gamma cameras, a spokesman added.

Varicam's capabilities include rapid processing of gamma camera inputs for dynamic-function studies, region-of-interest displays and profile curves, according to Varian.

Output can be read via a CRT terminal, a color or black and white television screen or a Varian Statos printer/plotter.

Varicam is supported by a special Varian real-time executive software system.

The system's major hardware elements include the V70, a 4.7M-byte disk storage unit, the Statos printer/plotter and auxiliary output devices specified by the user. It is available from Varian at 611 Hansen Way, 94303.

One-Day Course Slated on Micros

LOS ANGELES, Calif. – The Institute of Electrical and Electronics Engineers, Inc. (IEEE) will offer a one-day course on microprocessors at the Rodger Young Center here on Feb. 28.

The course, part of IEEE's Continuing Education Service, is scheduled for 9 a.m. to 4 p.m. Cosponsored by the institute's Educational Activities Board and the Los Angeles Council, it is aimed at the practicing engineer who wishes to acquire a basic understanding of microprocessors and their application to industrial control of data acquisition situations, IEEE said.

Fees, including course material and a luncheon, are $5 for IEEE members, $25 for student members and $70 for nonmembers.

Additional information is available from the Educational Registrar, IEEE, 445 Hoes Lane, Piscataway, N.J. 08854.

Pro-Log Offers Users Free Guide to Micros

MONTEREY, Calif. – A 36-page booklet, "The Microprocessor User's Guide," includes sections on microprocessor characteristics and microprocessor design.

The booklet is free from Pro-Log Corp., 2411 Garden Road, 93940.

Process Control Packaged for PDP-8

MINNEAPOLIS – A process control package for Digital Equipment Corp.'s PDP-8 minicomputer comes with everything needed to hook up a 16-, 32- or 64-channel direct digital control system, according to the package's vendor, Research, Inc.

The package includes an operator's terminal, software and cables. The user supplies the mini, heaters and thermocouples.

The package costs about $375 per channel for a 64-channel system with load currents of 10 amp at 230 Vac. Research is at P.O. Box 24064, 55424.

Interdata Adds Mini I/O For Industrial, Lab Use

OCEANPORT, N.J. – A data acquisition system for industrial and laboratory use has been introduced by Interdata, Inc. here.

The Interdata Mini Input/Output system provides a range of analog input, analog output and digital I/O modules for 16- and 32-bit Interdata computers.

Mini I/O system prices vary according to quantity and system functions and range from $310 for a 16-channel digital I/O module to $1,670 for a 12-bit, 40 kHz eight differential-channel converter.

All systems are available immediately and can be installed on any Interdata computer's multiplexer or selector channel, the firm said.

Both Interdata multitasking operating systems, the OS-16MT for 16-bit computers and the OS-32/MT for 32-bit computers, support Mini I/O. The industrial systems can be programmed with standard Interdata supervisory calls or via the Instrument Society of America's real-time extensions to Fortran IV and V.

Mini I/O is composed of three independent subsystems: analog input, analog output and digital I/O. Each subsystem is self-contained and includes the module and computer interface while using the Interdata central processor's chassis and power supply.

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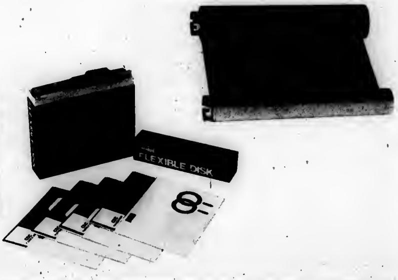

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Basic/Four Printers Bow

IRVINE, Calif. – Two high-speed line printers have been introduced by Basic/Four Corp. for its business systems.

Designed for handling large volumes of forms and reports, the Model 3500 operates at 300 line/min, while the Model 3600 operates at 600 line/min.

Features include simplified operator controls, an 8-channel vertical forms unit for slowing to preselected positions and a switch for selecting either six or eight line/in.

An additional printer feature is a paper stacker for ease of gathering processed documentation, according to the company.

The printers are available with a standard 64-character or an optional 96-character (upper- and lower case) type font. They can accommodate forms from 4 in. to 16-3/4 in. wide. The free-standing units have an enclosure designed to reduce printer noise.

The basic Model 3500 costs $11,900 or $262/mo on a 66-month lease plan. The Model 3600 sells for $17,900 or $394/mo on the lease plan. The units are available from 18552 MacArthur Blvd., 92714.

VRC Has Controller

NORTH SPRINGFIELD, Vermont – Vermont Research Corp. (VRC) has an OEM disk memory controller.

The Model 8401 controller interfaces up to four Model 5017 disk drives to the Digital Equipment Corp. PDP-11 minicomputer providing memory capacities up to 81.92M 16-bit words.

The VRC controller is functionally equivalent to the DEC RP11-C/RP03 memory system, from the firm at Precision Park, 05150.

SIA Releases 8-Bit Micro

GLENMOORE, Pa. – A three-card 8-bit microcomputer featuring direct memory access with priority has been introduced by System Integration Associates (SIA) here.

The module set, designated the SIA-3000, includes a processor board, random-access memory (RAM) board, utility board and a card cage that can hold up to five boards. Power supplies are also available.

Features of the system include programmable read-only memory (Prom) and RAM capabilities, direct test monitoring and debugging facilities and microcode development software.

The SIA-3000 system is comprised of a processor board which includes the Intel 8080 processor, crystal clock circuitry, I/O port decoding, interrupt logic, system interconnect logic, data bus logic and provision for 16K bytes of Prom memory.

In addition, a RAM board includes three priority controlled channels to a maximum of 16K bytes of random access read/write memory and necessary refresh logic for the dynamic RAM.

The SIA-3000 costs $2,000, the firm said from Little Conestoga Road and Adams Drive here.

DEC PDP-8s Get Program Loader

BEDFORD, Mass. – The Betatech, Inc. 8 is a complete bootstrap and loading system for Digital Equipment Corp. PDP-8 minis on a single plug-in quad Omnibus-compatible circuit card.

The unit includes a hardware boot, miniature tape drive and the necessary software to create, verify and load tapes containing core images up to 20K words, the company said.

Depression of a button reinitializes the computer and loads the 32-word bootstrap program from internal react-only memory, which then loads the application program and begins its execution.

The Autoload 8 is available in two configurations: Model 8 has the tape drive and controller as an integral part of the circuit board; Model 8E provides the tape drive and controller external to the computer and connected to it by a ribbon cable.

Unit price for the Model 8 is $950; for the Model 8E, $990, from the company at 110 Great Road, 01730.

C/P Turnkey Unveiled

WEST SIMSBURY, Conn. – The C/P Based Mini-System from Computer Covenant Corp. is said to provide a single or multiuser, interactive, application-oriented turnkey system.

Application systems offered are order entry and invoicing, inventory control, accounts receivable, sales analysis, accounts payable, payroll and general ledger.

The system includes a 16K-byte CPU, CRT, removable and floppy disks and 50 line/min printer, the firm said.

The system leases from $900/mo from the firm at 136 Old Farms Road, 06092.

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Unfortunately, at a lot of banks, supermarkets and other retail outlets, it's a complicated, time consuming process.

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The system includes the Transaction telephone terminal, the switched network, and 407 type data station interface. Plus, the data base computer.

The terminal itself is intended as the remote telephone in a digital inquiry-voice answer system. It has a single slot through which automatic dialing and bank or credit cards are passed. (If it's a check, the user keys in the account number.)

The Transaction telephone automatically enters customer and user information by reading the magnetically encoded ABA Track II stripe found on the back of most major bank and credit cards. It also fully buffers all of the data input.

Sequential instruction lights guide the user through the simple data input procedure. While the data is being entered, the telephone dials the number of the data base needed for verification. All of the buffered information is then sped through the switched network and the 407 type data station. Customer information is withdrawn, and an audio or visual response is relayed to the user.

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Term Outmoded? – Part 1

Minicomputer Makers Grapple With Product Definition

By Molly Upton
Of the CW Staff

Fill in the missing word. The acknowledged leading maker of____s has not defined as corporate policy the term "____."

The term "____" no longer has a useful function. We prefer to be known as a computer company, one ____ manufacturer said.

IBM's General Systems Division said. IBM does not use the term, but calls its products smaller systems.

These were some of the more explicit definitions received in a *Computerworld* survey.

The term "minicomputer" is becoming as difficult to define as Superman. While attempts made included slicing up the glutinous pie from standpoints of price, function and capabilities, most agreed minis have butted their way into the general-purpose computer spectrum and are being invaded by micros at the other end.

Winston Hindle, senior vice-president and group manager for small computers at Digital Equipment Corp., said DEC has not defined as corporate policy what a minicomputer is "nor do we intend to."

His personal definition is a computer system that costs less than $50,000, with no functional definition.

Hewlett-Packard Co. acknowledged it has no official definition on which all HP people must concur. Indeed, two men from HP presented different views of the low end of the computer universe.

William Rosser, director of corporate planning for Interdata, Inc., said, "As far as we're concerned, we certainly feel it is fruitless to solidify the definition of a minicomputer."

"The term 'minicomputer' is a label that had a fairly useful function. It's losing that function rapidly," Rosser said.

Interdata will probably trend toward the use of the word "computer" rather than "minicomputer" to describe its products, he said.

Many Interdata customers, he explained, don't necessarily want to refer to their machines as minicomputers for reasons of politics within their companies.

"The term 'mini' is failing because of the expansion of the range of products," Rosser added.

Donald W. Fuller, president of Microdata Corp., said the "minicomputer itself is an anomaly. It got its start through a need for dedicated applications in scientific and industrial instrumentation.

"But within two years it will be part of the general-purpose mainframe field. The traditional mini marketplace is fracturing," he said, adding there is no lack of

(Continued on Page 46)

CII, Honeywell Agree on Merger Terms

By Molly Upton
Of the CW Staff

MINNEAPOLIS – Agreements embodying the goals established at the outset of negotiations have been reached for the merger of Compagnie Honeywell Bull (CHB) and the general-purpose computer business of Compagnie Internationale pour l'Informatique (CII), according to Honeywell, Inc. President Edson W. Spencer.

French interests will hold 53% of the new firm, to be called Compagnie Internationale pour l'Informatique-Honeywell Bull (CII-HB) and 47% will be held by Honewyell Information Systems, Inc. a Honeywell, Inc. subsidiary.

The merger is subject to certain conditions of closing, including approval by French stockholders and owner groups at meetings to be held in the first quarter.

Spencer said Honeywell and CII-HB are committed to following a common product strategy and carrying forward the concept of line unification, while sharing development responsibilities and investments.

Honeywell initially will hold three seats on the five-member technical committee that will be formed to recommend worldwide product strategy, product plans, research and development budgets and introduction of new products.

The ratio of membership on the technical committee will be based on comparative annual operating revenues of Honeywell Information Systems and CII-HB.

Honeywell and CII-HB will have the right to manufacture any product in the common line, with decisions based on the respective managements'. judgments of the economic feasibility of local production, Spencer said.

Spencer indicated he expects Honeywell's computer marketing position in Europe, particularly France, will be strengthened by the merger.

A government-sponsored finance company will purchase computers for the French government and nationalized industries, he said.

French government subsidies to the firm over a four-year period are expected to total about $280 million, which will offset expenses of the merger, Spencer said.

Honeywell will receive about $58 million in cash for its share of equity in Honeywell Bull being sold to Compagnie des Machines Bull (CMB), which currently owns 34% of CHB.

In addition to CMB, other French owners are Compagnie Generale d'Electricite and an agent of the French government.

Time-Sharing Firm Formed

As part of the agreement, a new time-sharing company, to be called Honeywell Bull Network Information Services, will be organized from the assets and personnel of the present Network Information Services of Honeywell Bull.

The new time-sharing firm will be owned 51% by HIS and 49% by CMB. It will continue to carry on the time-sharing business, providing General Electric Co.'s Mark III service in France, Austria, Germany, The Netherlands, Norway, Spain, Sweden and Switzerland.

Jean Pierre Brule, currently president and director general of HB, has been nominated to the same position at CII-HB, which is expected to have about 20,000 employees – 15,000 from HB and 5,000 from CII.

Honeywell Assumes Xerox Maintenance

MINNEAPOLIS – Honeywell, Inc. and Xerox Corp. have inked the pact enabling Honeywell Information Systems, Inc. to provide maintenance and marketing support services to Xerox mainframe customers in the U.S.

Comparable agreements between overseas and Canadian subsidiaries and affiliates are expected to be signed early this year.

The arrangement, which generally follows the letter of intent, calls for Honeywell to be responsible after Jan. 31 for essentially all marketing contacts with Xerox mainframe customers and potential customers for equipment and services [CW, Oct. 22].

Honeywell will offer employment to over 600 U.S. Xerox employees, most of whom are in field service.

Honeywell said it will retain most maintenance revenues and, in most cases, 40% of the balance of payments from leases, installment sales or future sales of Xerox computer equipment.

No other cash payment is involved other than employee benefits exchanges, Honeywell said.

Singer Write-off $400 Million

NEW YORK – Singer Co. will include in its 1975 financial statement provisions totaling about $400 million for expenses and write-downs related to its decision to withdraw from the manufacture and sale of computers and point-of-sale (POS) systems over the next 12 months.

Approximately $325 million of that sum relates directly to the Business Machines Division.

None of the $400 million loss can be applied to profit made in the past three years, because prior losses have surpassed such profit, a company spokesman said.

In line with the decision to discontinue the division, Singer has modified the terms of its revolving credit arrangement with the banks.

The Business Machines Division itself had a loss of $18 million in the first nine months of fiscal 1975, contributing significantly to the company's overall net loss of $37.2 million for the period.

Singer's withdrawal from the computer and POS market follows the 1974 termination of the electromechanical billing and accounting product line of the Business Machines Division. That move led to a write-off of $30 million and a net loss for the year of $10.1 million.

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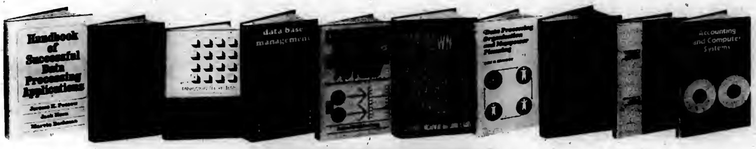
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Cost of Satellite Venture Estimated at $250 Million

By Molly Upton
Of the CW Staff

WASHINGTON, D.C. – The total estimated cost of the Satellite Business Systems (SBS) system is $250.6 million from the date of inception of its predecessor, CML Satellite Corp., to the commencement of commercial service, according to a proposal submitted by SBS' three partners to the Federal Communications Commission (FCC) [CW, Dec. 31-Jan. 5].

The partners, subsidiaries of Comsat General Corp., IBM and Aetna Casualty and Surety Co., are prepared to invest $165 million in the venture, the proposal said.

Any funding in excess of $165 million necessary to establish and operate the proposed system will be obtained from external sources. Failing that, the partners will consider further contributions to funding, the proposal indicated.

Three Elements

The $250.6 million figure consists of $119 million for the space segment, $24.7 million for the ground segment and $16.9 million for system development and in-house construction.

Those figures include inflation and contingency factors, the report noted.

Total expenditures to date, including Comsat General's earlier purchase of CML stock, total about $11 million, which the IBM and Comsat General subsidiaries have shared equally.

One-Third for Aetna

The proposal also outlined how a new subsidiary of Aetna Casualty and Surety Co., Aetna Satellite Communications, Inc., might assume a one-third ownership of the new venture, the same amount held by the IBM and Comsat General Corp. subsidiaries.

The partners are currently committed for up to $55 million each. Prior to approval by the FCC, the units of Comsat General and IBM, except for $1,000 from Aetna's unit, will share equally in the funding of SBS, the proposal said.

Upon approval by the FCC, Aetna Satellite Communications will acquire a 15% ownership interest, with Comsat General Business Communications, Inc. and IBM's Information Satellite Corp. each holding 42.5%.

The balance of Aetna's investment will consist of loans convertible to equity that could bring its total ownership to one-third.

Control of the SBS venture is scheduled to be split equally among the three partners, at least until the commencement of the system's operations and barring contingencies, the proposal said.

When operations begin, Aetna "will then elect whether to achieve a full one-third ownership interest for" Aetna and Aetna Satellite Communications together "or limit such interest to 15%," according to the proposal.

"In the latter event the control of SBS would be distributed among the partners in accordance with their respective ownership interests."

When the SBS 12- and 14 gHz system becomes operational, Aetna must decide whether to exchange its debt for an equity interest or for long-term subordinated unguaranteed debt obligations of SBS.

If Aetna elects long-term debt, the vote of each partner would be weighted according to its ownership interest.

In any event, SBS will conform to the requirement issued by the FCC that no partner "shall have less than a 10% ownership interest or more than a 49% ownership interest."

The proposal indicated the feasibility of the SBS proposals is based in substantial part upon the ability of SBS to begin offering 12- and 14 gHz domestic satellite service in 1979, which it believes it can do if the FCC approves its application by early autumn.

Possible Contingencies

The proposal mentioned several contingencies that might arise which would cause modification of ownership interests, funding arrangements or both. These include bankruptcy of a partner, default by a partner, failure to unanimously agree on whether the FCC action on this application is favorable and prohibition of performance by Aetna and Aetna Satellite Communications as a result of applicable state laws, according to the document.

Regarding staff, upon approval by FCC the new venture will have its own officers and employees, with no director, officer

(Continued on Page 46)

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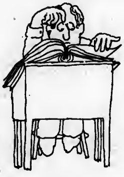

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Minicomputer Vendors Grapple With Product Definition

(Continued from Page 43)

business for any sector of the mini arena.

Fuller distinguished between minis and micros by observing that a micro is more of an instrument component, a computational and control device, with only a limited amount of input/output capability.

A mini is more of a systems component that can handle multiple high-speed I/Os with memory timing, direct memory access, a real-time clock, power and failure-protect features.

Minis are becoming more of a systems product in the low end of the general-purpose range, where they should have been in the first place as small systems, he said.

Definition Varies

William Shipman, Honeywell Information Systems' national marketing director for minicomputers, said the definition varies as mini technology and applications evolve.

Roy L. Phelan, NCR's vice-president of research and development, said "We define a minicomputer as a versatile stored-program digital computer suitable for general-purpose applications.

"Its chief characteristics when compared with mainframe computers are smaller size, lower cost and the ability to be adapted to virtually any systems-related task."

Dave Stein, vice-president of marketing for Computer Automation, Inc., observed that minis currently span a price range from at least $5,000 to $500,000, which is "two decimal orders of magnitude and is consequently not a meaningful distinction."

He projected that the same will happen to micros in about 10 years, with the price range starting for pennies and extending up to $5,000.

A Data General Corp. (DG) spokesman said, "the concept of mini, like the mini itself, has grown up and evolved quite far from what it used to be – an easily identifiable machine."

Data General feels the definition has "moved from a hardware, architecturally oriented set of criteria to a more functional set of criteria," a spokesman said.

"The division as we see it is that large computers are sold in terms of solutions, minis as tools and micros as devices. To hone in on that further, a functional definition of mini is a dedicated real-time system, which compared with micros has more computational capability," he said.

A large computer is principally batch-oriented, he said. However, he said, the definition of "dedicated" has become more inclusive than it was previously.

Architectural criteria apply to a degree, but not as much, since a function can change the configuration, he observed.

One could call Eclipse S200 a mini, but if one took a C300, one could put five 3330s on it, so it would hardly be a mini, but it's essentially the same machine, he said.

DG still uses the term "mini," calling itself a "major minicomputer manufacturer."

According to its functional definition, all of DG's CPUs are minis, he said.

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IBM, SBS Partners See Satellite Venture Costing $250 Million

(Continued from Page 45)

or employee of Aetna, Comsat General, IBM or the subsidiaries being an officer or employee of SBS, the firms said.

Until FCC approval, however, Philip N. Whittaker, on assignment from IBM, will serve as acting president of SBS during an interim period and the SBS staff will be augmented by a limited number of employees assigned to SBS by the affiliates.

A nine-member Partners' Committee, with membership and voting rights shared equally among the three partners, will exercise policy guidance and direction of SBS.

A three-person Executive Committee, with one representative from each partner, will provide policy direction to SBS between meetings of the Partners' Committee.

Hilliard W. Paige, who engineered the restructuring of the venture and has been CML's chief executive since 1973, will resign with the conclusion of the restructuring.

IBM personnel on the Partners' Committee include John R. Opel, president and director of IBM; Bob O. Evans, vice-president of IBM and president of the System Communications Division; and P. Martin Foley, vice-president, business plans of IBM.

Comsat General's members are Joseph V. Charyk, president and director of Communications Satellite Corp and chairman of Comsat General; John A. Johnson, president and director of Comsat General Corp.; and Joseph H. McConnell, chairman of Communications Satellite Corp. and director of Comsat General.

Personnel from Aetna Casualty include Donald G. Conrad, director and executive vice-president; John H. Filer, chairman; and John M. Galvin, senior vice-president of the Diversified Business Division.

CML Satellite Corp. has changed its name to Comsat General Business Communications, Inc. and remains a wholly owned subsidiary of Comsat General and its representative as a partner in SBS.

Pertec, CMC Approve Merger Agreement

EL SEGUNDO, Calif. – Pertec Corp. and Computer Machinery Corp. (CMC) have signed an agreement merging CMC into Pertec, following the unanimous approval of the boards of directors of both companies.

The agreement, consistent with a letter of intent signed in September [CW, Oct. 1], called for the exchange of 1.8 million shares of Pertec stock for all outstanding shares of CMC.

The merger will give Pertec "an immediate entry into the end-user marketing arena with an in-place, well-trained marketing and customer service organization and the combination of Pertec's financial strength and manufacturing expertise with CMC's market base and lease portfolio," Ryal R. Poppa, Pertec president, said.

In Current, Near-Future Lines

Expanding Marketplace for Products Game Plan at STC

By Toni Wiseman
Of the CW Staff

LOUISVILLE, Colo. – Expanding the marketplace for the current and near-future product lines is the game plan at Storage Technology Corp. (STC).

For STC, that means finding new areas in which to market its tape and disk systems. The company will also be looking at markets for the Ultimacc line of processors which it acquired in March last year and merged into STC Systems, Inc., STC officials said in a recent interview here.

In line with the Ultimacc acquisition, long-range plans call for STC to supply Ultimacc with all necessary components, either from in-house manufacturing or through the acquisition of other companies, probably by 1978, the officials said.

The end-user arena will continue as the main market for all products, according to STC President Victor Casebolt, but the OEM market is a new opportunity which the company will continue to pursue.

In fact, OEM tape contracts with CII, Siemens, Digital Equipment Corp. and Univac in the last 18 months amount to more than $30 million.

Casebolt, who has been with STC since Nov. 3, plans to operate on the philosophy that "we don't want to be 'me too's.'"

"STC is a very viable company, but you can't be too smug in this business; you have to stay on your toes because of the competition.

Rewards In Growth

"It's still a relatively high-risk industry, but the rewards are there. There are few industries in which a company can grow like STC did in six years," he said, noting that the company had in fact grown from scratch in 1940 to revenues of $100 million last year. STC was profitable during the last three years.

STC's growth has essentially been accomplished with magnetic tape drives, Casebolt said, but now the Super Disk is being produced in quantity, and the market for disk drives is several times that for tapes.

This year will be a big one for disks, the Super Disk in particular, according to Roy Wigginton, vice-president of sales, with the production of the 8800 line really gearing up.

The 8800 and 8400 disk modules have capabilities of 800M bytes and 400M bytes respectively, Wigginton said, adding that a controller attaching the maximum eight 8800s provides 6.4 million bytes.

Super Disk Picked Up

Interest in the Super Disk picked up when IBM announced its 3350, blessing the concept, he said, noting that there are currently 17 Super Disk installations.

While Super Disks can presently be attached only to Model 370/135s and up, plans call for a 360/50 interface soon, Wigginton said.

Wigginton doesn't feel that the IBM 3350 announcement has hurt STC, because, he said, "our intent was never to replace all the 3330 modules out there." In addition, the price per byte is still much cheaper with STC's disk, he said.

While IBM will begin shipments of the 3350 in March, the 8000 series has been on the market since late 1974, and plans call for new products in the line by the end of this year, he added.

The technology behind the Super Disk is future-oriented to allow for growth, Milan Mraz, director of planning, said.

"The data requirement for storage will be increasing by factors of 10-fold to 100-fold during the '70s," he said.

Wigginton also anticipates an upswing in the 6250 tape line. STC's main marketing emphasis has been on placing tape drives, he said. This year will see more emphasis on marketing disk products.

"The major trend from tape to disk has already occurred, but the market for tapes continues to grow. Disk is not necessarily growing to the disadvantage of tape," Wigginton said.

"In most installations there are already more disks than tapes, but in some application's tape is much more viable."

In addition to its own storage products, STC has signed a contract with National Semiconductor, Inc. (NSI) to purchase memory on an OEM basis. STC will then market and service it.

The rationale behind the move is that most people want to deal with as few vendora as possible, Wigginton said. "Since the same person usually makes decisions on both memory and tapes or disks and, since we are already in many installations, the NSI contract is a complement to our current business and a way we can get certain revenues for a low investment," he said.

The company is now operating in two fields, information storage and, since the Ultimacc acquisition, distributed computing, Jesse Aweida, STC chairman, said.

"In disk drives, we've concluded that low cost, on-line, randomly available information is what people will want. They need constantly greater capability on-line and no longer want or need to remove the media as in the days of tapes.

"So now they are moving to nonremovable storage," he said, and the Super Disk is currently the largest nonremovable unit.

While the 6250 and Super Disk products will fit the requirements of the industry for the next five to 10 years, STC is working on products to fill the gap between add-on and rotating memory, he said.

"We're after the same market for Ultimacc that we're serving today," he said.

The potential market for distributed computing will be in the $15 billion range, Mraz estimated.

Looking to 1980, when distributed processing will be a well-established procedure, data storage will represent the largest dollar percentage of installation value, "and large centralized storage will be a vital part of these distributed processing installations," Mraz said.

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If you're involved with dedicated systems at your installation, or if you will be in the near future, then you should be reading this special supplement in the January 26th issue of *Computerworld*. And if you're a developer and marketer of turnkey systems, then you should advertise them here. Ad closing is January 9. Contact your *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.

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Fujitsu Expands Office Series

TOKYO – Fujitsu Ltd. has expanded its office computer series available in Japan with the addition of the Facom VOS and Facom BM and upgraded its existing Facom VO.

The VOS was developed as a smaller version of the VO and lies between general-purpose computers and billing machines, the firm said.

The BM was designed for billing purposes and can interface with large computers.

The VOS has up to a 36K semiconductor memory and a built-in disk pack drive unit with either .5M or 1M bytes or a drum unit with a capacity of 262K bytes. An attached keyboard printer to handle bills is also included.

Other features include a disk cartridge drive up to 10M bytes, cassette, floppy disk and a line printer with speeds up to 100 line/min as well as paper tape, card and optical mark reader units.

The VOS has a library of 19 program packages and handles Cobol, Fortran and the 'Taskforce' language.

The BM has up to 32K bytes of main memory and can have drum storage as well as floppy disk, disk cartridge, cassette, paper tape and card units and keyboard.

Three different types of printers are available. These include the same line printer as with the VOs, a 55 line/min journal printer and a serial printer.

The language for the BM is Billing-Oriented Language 1 and there is also an application library.

Upgrade features for the VO enable it to expand memory to 48K bytes, handle 40M bytes per four spindles of cartridge disks and connect a display unit and an optical character reader.

The billing printer speed was increased to an average of 45 char./sec.

Control Systems Among Topics At USSR-U.S. Commission Meet

By Yuri Shevyakov
Novosti Press Agency

MOSCOW – Computerized control systems was one of a number of topics discussed by participants at a meeting of the Fourth USSR-U.S. Commission on Scientific and Technological Cooperation here last fall.

Other topics included chemical catalysis, microbiological synthesis, water resources, electrometallurgy and forestry.

During the three years of the commission's existence, 24 topics of joint research have evolved, which means preliminary work on almost half of the 49 topics planned has been completed. Joint laboratory research is under way.

A number of difficulties had to be overcome before work could be started in many directions, according to experts of both countries.

There are certain differences in the development of science and technology in Russia and the U.S. and, therefore, different criteria, methods of financing and directing research and ways of tackling similar tasks.

For this reason the joint working groups devoted a lot of time to elaborating compromise criteria, compiling common-term dictionaries and even revising some topics that had been previously approved.

"First we had to learn to cooperate," according to Dr. Donald D. Aufenkamp, head of the Computer Application in Research Division of the National Science Foundation.

The topic "Application of Computerized Control in Management" directed on the American side by Aufenkamp demonstrated the difficulties encountered.

For instance, because of its socialist system, the USSR did not find the factors of chaos of market competition and private ownership relations relevant.

However, of interest to the USSR was the organizational experience accumulated in the U.S. in using computers in management.

Soviet specialists were interested as well in the American experience with large-scale use of computers and information systems, application of systems analysis and creation of flexible organizational structures.

American experts, on the other hand, showed interest in the Soviet experience of management planning.

"We are conducting research jointly with American specialists on five topics," said Bashir Rameyev, head of a department of the State Committee for Science and Technology and director of the Soviet staff working on computer application in management.

"All these topics are important for the national economies of the USSR and U.S. For instance, the USSR has achieved more than the U.S. in the theory of economic-mathematical modeling – especially in reference to power engineering," he said.

"However, the U.S. is ahead of the USSR in the practical realization of models of this kind. This is just one example of mutually beneficial cooperation."

Foreign Orders & Installations

Daman Computer Services of Swinton, Manchester, England, has ordered an NCR Century 200.

Industria Siciliana Asfalti e Bitumi of Italy has ordered a Univac 1106 system for a new oil refinery in Sicily.

Kamaz USSR/Repiquet, a Russian rubber manufacturer, has ordered three Measurex System 2000 digital computer control systems for installation on tire fabric calendars.

Urban Computers Canada has installed a Univac 90/30 to handle new customers for its service bureau operations.

Two Measurex control systems have been ordered by Arjomari-Prioux of France.

GSW Appliances Ltd. of Canada has ordered a Univac 90/30 to replace its IBM 360/22.

The Social Security System of the Republic of the Phillippines has ordered two NCR Century 201 computers, 10 NCR 657 high-density dual-disk units, five disk controllers, communications equipment and 20 visual display units.

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Clearinghouse Picks Students

German DP Education Differs From U.S.

Special to Computerworld

SEATTLE – Computer science education in Germany follows in the traditions of the German educational system in general, according to Prof. Hellmut Golde of the University of Washington, who has just returned from a year's sabbatical leave there.

Because of that, it differs in many ways from computer sciences education in this country, he said.

Golde spent his sabbatical at the University of Karlsruhe in southwest Germany, teaching in the Department of Informatics there. Karlsruhe is the largest computer sciences school in the country, he said, with an enrollment of about 600 students in that curriculum.

Computing hardware at the school is profuse, but personnel support is marginal at best, Golde said. Government funding has provided a university computer center with twin Univac 1108s and a computer sciences lab with a dual Burroughs B6700s.

Maintenance funding limitations result in a support level of only 1.5 system programmers for the computer sciences installation; the system is therefore often clogged with jobs during its two-shift operation, Golde said.

All work is input through about 100 remote terminals hard-wired to the B6700. Acoustic couplers are not allowed by the government, he said, and even if they were telephone service is prohibitively expensive.

However, the system is so busy bad turnaround causes users to treat the terminals as remote job entry devices rather than time-sharing terminals.

Classes at Leisure

Coursework and examinations are treated asynchronously, he said. Students attend classes at their pleasure, and take examinations when they believe they are ready.

Computer sciences students typically take only related courses; the liberal arts education in the German system is achieved in the high school.

Additionally, students are channeled at the fifth grade-level into academic, clerical or trade paths and only the intellectual elite ends up attending a university, Golde said.

Enrollment in many fields, such as computer sciences, is controlled by a federal clearinghouse because there is not enough space in universities. The choice of institution is made by the government.

Algol 68 forms the language basis for the computer sciences instruction at Karlsruhe, according to Golde. However, classwork is actually programmed in Burroughs Extended Algol on the B6700, which the student must learn on his own.

Fortran is now the dominant language in Europe, Golde said; Algol's importance has steadily dwindled in the industrial environment.

Very few women are found in computer sciences at Karlsruhe – about 2% compared with about 20% in the U.S., Golde said. That seems to stem from traditional attitudes in the academic channeling process in general, he feels, rather than computer sciences attitudes specifically.

ICC and Codex, U.S. Modem Makers, Awarded Contracts From Overseas

Two U.S. modem makers have received contracts from Australia and Sweden.

International Communications Corp. (ICC) has received a contract from the Australian Telecommunications Commission to provide Modem 96 multimode modems for use in the commission's Datel Service for private-line subscribers.

Codex Corp. has been awarded a contract in excess of $1.25 million from the Swedish Telecommunications Board for Codex 9,600 bit/sec modems.

Other Awards

Computer Sciences Corp. has been awarded a one-year, extendable contract from the National Aeronautics and Space Administration to provide facilities management services at the Marshall Space Flight Center in Huntsville, Ala.

Research, Inc. has been awarded a $630,000 contract by the State of California University and Colleges (CSUC) to provide the CSUC computer network with 375 Teleray time-sharing terminals.

National Data Corp. has received a contract to operate its credit-card authorization service from First Pennsylvania Bank of Philadelphia.

Rapidata, Inc. and National CSS, Inc. have received four-year contracts totaling $11.8 million from the New York Telephone Co. to provide time-sharing services.

Optimum Systems, Inc. has been awarded an extension of a DP services contract from the U.S. Environmental Protection Agency.

Data Development Systems, Inc. has received a contract from Downtown United Furniture Co. of Louisville, Ky., to design and implement an on-line installment payment and collection system.

Datacrown Ltd. has received a contract from Reed Paper Ltd. to provide DP services to Reed's operations in the U.S. and Canada.

Kennedy Co. has been awarded a contract from Data Pathing, Inc. for Series 9000 tape transports which will be used in terminal, data collection and source data automation systems.

Contracts

Florida Software Service, Inc. has received a long-term facilities management contract from Community Hospital in New Port Richey, Fla.

Qume Corp. has received a contract from Gen-Com Systems, Inc. for 1,000 Model Q30 and Sprint 45 and Sprint 55 character printers to be used in communcations and processing applications.

Mauchly-Wood Systems Corp. has been awarded a contract from the city and county of Denver, Colo., to assist the Denver Police Department in designing and implementing a new DP center.

Canham Gets Ansi Post

NEW YORK – Walter G. Canham Jr., engineering standards manager, Corporate Engineering Department, Monsanto Co., has been elected chairman of the American National Standards Institute's (Ansi) Executive Standards Council.

'High' Technology

ATLANTA – Management Science America, Inc. (MSA), a software company specializing in financial application packages, lent Rowland Emett's "Exploratory Moon-Probe Lunacyle" to Georgia Tech recently to aid Tech in its annual football game against the University of Georgia.

MSA has leased the Lunacycle from Emett and will display it at various Induatry conventions, demonstrating "high" technology has a sense of humor.

GTE/IS Quitting Europe End-User Mart?

By Andrew Lloyd

Special to Computerworld

PARIS – GTE Information Systems International has decided to pull out of the end-user hardware markets in France, Germany and Switzerland, according to sources here.

However, a GTE Information Systems (GTE/IS) spokesman in Connecticut denied the firm is cutting back its market and said it is continuing to do business as it has been.

"We plan to continue to support our end-users" and are "still moving forward on international and national end-user sales," the spokesman said.

French sources suggested that GTE/IS operations on the continent are about to be sold off to a French electronics company, possibly CGE or Thomson.

Off the Market

Products to be withdrawn are the 1101 communications controller, the 7800, an IBM 3270 replacement and the 1500 data entry system.

They will continue to be available to the OEM market together with the IS 1000 minicomputer system. The company also has no intention of withdrawing from the software market, according to Edward Clark, director of GTE/IS in France.

Speaking from Brussels, Belgium, Jim Kelly, GTE/IS European technical manager, would not confirm or deny suggestions that a deal between GTE/IS and CGE or Thomson was imminent, but explained the reasons for the pullout: "We've decided it's time to stop going around knocking on all those doors. It's too expensive."

Users in the three countries affected were informed of the decision to drop the products at the end of October and have been assured maintenance will be continued

The UK operation, established seven years ago, is apparently being continued in its present form. Unlike its continental counterparts, it has proved profitable.

The spokesman in the U.S. indicated GTE/IS is attempting to find ways of supporting isolated machines without having costs get out of hand and is thinking of using third-party maintenance in these instances.

Maintenance Highlight Of AFSM Conference

MEMPHIS, Tenn. – The Association of Field Service Managers (AFSM) will hold its first annual conference on maintenance Jan. 22-24 at the Hyatt Regency here.

Workshops will be held on maintenance, service information systems, logistics planning and support as well as management training.

Inquiries about membership should be directed to AFSM, 20501 Hatteras St., Woodland Hills, Calif. 91364.

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South & Southwest: Atlanta (404/634-5127), Dallas (214/638-4080), Houston (713/626-8705), New Orleans (504/523-2576).

West Coast: Los Angeles (213/386-5500), Irvine, CA (714/833-1730), Palo Alto (415/328-7155), San Francisco (415/434-2410).

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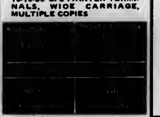

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MDS Inks Half-Year Results in Black

PARSIPPANY, N.J. – Mohawk Data Sciences Corp.'s (MDS) second-quarter and six-month results moved into the black, compared with losses in the year-ago periods.

For the quarter, the firm earned $277,000 or 4 cents a share compared with a loss of $3.6 million or 58 cents a share in the same period a year ago.

Total revenues declined to $38.8 million for the three months compared with $39.9 million a year ago.

Sales dropped to $11.6 million from $13.6 million while rental and service income rose to $27.3 million compared with $26.4 million in the year-ago period.

During the six months ended Oct. 31, MDS earned $2.4 million or 36 cents a share compared with a loss of $10.5 million or $1.68 a share in the same period last year.

Revenues declined in the six months as well; to $80.6 million from $83.2 million in the year-ago period.

Sales dropped to $24.6 million from $30.4 million while rental and service income rose to $56.1 million from $52.9 million.

During fiscal 1975 the unamortized balance of deferred exchange losses was written off with a $4.3 million charge against the six-month period as a cumulative effect of this change.

During the six months, there was a $141,000 profit realized from the sale of a subsidiary, whereas in the year-ago period there was a loss of $653,000 from discontinued operations.

Ralph H. O'Brien, MDS chairman and president, said the firm has reduced its bank debt by about $19 million during the first six months of this year.

Incoming order rates for the six months were below levels previously anticipated, he said.

Datapoint Sees Strong Year Ahead With Pretax Income 30% Higher

NEW YORK – Datapoint Corp.'s pretax earnings for fiscal 1976 should be 30% to 40% ahead of fiscal 1975 if the apparent economic recovery trend continues, Harold E. O'Kelley, Datapoint president, told analysts here recently.

The dispersed DP market should grow at a compound annual rate of more than 30% through 1980, making it the fastest growing segment of the computer market, he said.

As an example of the rapid technology developments, O'Kelley said 46% of Datapoint's backlog is for products that were not in production at the beginning of the year.

Backlog at the end of fiscal 1975 was $22.4 million compared with $16 million a year earlier, he said. With strong orders in the first quarter, Datapoint's backlog closed at $28.6 million, he said.

Quarter Earnings Rise 52% at AJ

SUNNYVALE, Calif. – Anderson Jacobson, Inc. (AJ) reported second-quarter earnings increased 52% and revenues climbed 41% over those of the year-ago period.

Earnings for the quarter ended Sept. 30 were $227,215 or 9 cents a share compared with $149,061 or 6 cents a share in the same period a year ago.

Revenues totaled $4.3 million compared with $3 million in the year-ago quarter.

Record Income

Although the company experienced a lower rate of order input during the quarter than it had a year ago, record high income in the lease and service area accounted for the profitable period, the firm said.

Results also increased for the six months, with earnings of $421,787 or 17 cents a share compared with $301,546 or 12 cents a share last year.

Half-year revenues, up 44%, reached $8.4 million compared with $5.8 million in the year-ago period.

Calcomp Eyes Growth

ANAHEIM, Calif. – Lester L. Kilpatrick, president of California Computer Products, Inc. (Calcomp), told shareholders at the annual meeting Calcomp's goal is a 12% growth rate with sales volume reaching $200 million by 1980.

Fiscal 1976 "should be a turnaround year" following a loss on revenues of $122.9 million in fiscal 1975, he said.

TRW Finances 370/158

The Systems Group of TRW has financed a fourth IBM 370/158 through Finalco of Vienna, Va.

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Earnings Reports

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Year Ended Sept. 30

	1975	1974
Shr Ernd	$.92	.....
Revenue	47,400,608	$28,903,323
Earnings	1,116,127	(906,002)
3 Mo Shr	.32	.....
Revenue	17,852,235	4,497,162
Earnings	395,474	(654,886)

COMPUTER CONSOLES
Nine Months Ended Sept. 30

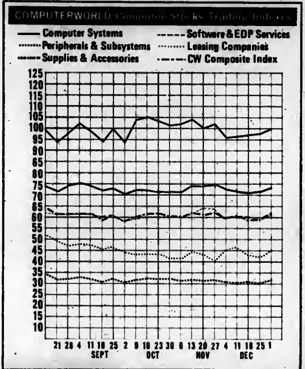
	1975	1974
Shr Ernd	$.36	$.72
Revenue	8,312,081	8,554,877
Tax Cred	284,500	534,000
Earnings	592,816	1,268,227

ON-LINE SYSTEMS
Three Months Ended Oct. 31

	1975	1974
Shr Ernd	$.18	$.54
Revenue	2,871,399	3,150,624
Earnings	153,986	454,112
6 Mo Shr	.25	1.05
Revenue	5,073,991	6,140,782
Earnings	213,413	881,322

KEYDATA
Three Months Ended Oct. 31

	1975	1974
Shr Ernd	$.08	$.01
Revenue	3,663,000	3,154,000
Tax Cred	97,000	15,000
Earnings	209,000	34,000



SPERRY RAND
Three Months Ended Sept. 30

	1975 (000)	a1974 (000)
Shr Ernd	$.91	$.83
Revenue	758,060	721,893
Earnings	31,371	28,586
6 Mo Shr	1.75	1.60
Revenue	1,529,238	1,431,577
Earnings	60,532	55,125

a-Restated to reflect accounting change for certain compuer engineering costs.

SINGER
Three Months Ended Sept. 30

	1975 (000)	1974 (000)
Shr Ernd	.....	$.20
Revenue	$561,112	561,762
Disc Op	(27,885)	(36,274)
Loss	34,657	31,479
9 Mo Shr	.....	2.24
Revenue	1,746,704	1,759,397
Disc Op	(29,427)	(42,056)
Earnings	(37,223)	336

NCR
Three Months Ended Sept. 30

	1975 (000)	1974 (000)
Shr Ernd	$.65	$.81
Revenue	521,571	488,106
Earnings	15,876	19,924
9 Mo Shr	1.97	2.13
Revenue	1,515,978	1,352,615
Earnings	48,645	51,825

MOHAWK DATA SCIENCES
Three Months Ended Oct. 31

	1975	a1974
Shr Ernd	$.04	.....
Revenue	38,892,000	$39,910,000
Disc Op	.....	(53,000)
Tax Cred	550,000	.....
Earnings	277,000	(3,604,000)
6 Mo Shr	.36	.....
Revenue	80,624,000	83,224,000
Disc Op	141,000	(653,000)
Spec Item	c1,235,000	b(4,285,000)
Earnings	2,435,000	(10,474,000)

a-Restated. b-Cumulative effect of accounting change. c-Tax credit.

MILGO ELECTRONICS
Year Ended Sept. 30

	1975	a1974
Shr Ernd	$2.50	b$1.64
Revenue	40,409,945	30,795,510
Earnings	4,248,466	2,723,915
3 Mo Shr	.57	b.37
Revenue	10,335,571	8,206,268
Earnings	993,246	605,941

a-Restated. b-Adjusted for a 5% stock dividend in February 1975.

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JANUARY 7, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1975-76 RANGE (1)	CLOSE JAN 7 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	62-109	84 3/4	+1	+1.1
O	COMPUTER AUTOMATION	2- 11	11 1/4	+1 1/2	+13.3
N	CONTROL DATA CORP	11- 23	19 3/8	+1 3/4	+9.9
N	DATA GENERAL CORP	10- 43	43 1/8	+5 3/4	+15.3
O	DATAPOINT CORP	6- 27	26 3/4	+3 1/4	+13.8
O	DIGITAL COMP CONTROL	1- 4	1 3/4	+ 1/4	+16.6
N	DIGITAL EQUIPMENT	46-143	142 3/4	+3 7/8	+4.2
N	ELECTRONIC ASSOC.	2- 3	2 3/8	+ 3/8	+18.7
A	ELECTRONIC ENGINEER.	3- 10	7 7/8	+ 1/2	+6.7
N	FOXBORO	23- 47	30	+2 5/8	+9.3
O	GENERAL AUTOMATION	4- 14	6 1/4	+1 1/8	+21.9
O	GRI COMPUTER CORP	1- 1	1/2	0	0.0
N	HEWLETT-PACKARD CO	38-123	99 1/4	+4 3/4	+3.3
N	HONEYWELL INC	22- 40	35 1/4	+1 7/8	+3.6
N	IBM	138-230	228 1/2	+4 1/4	+1.8
O	MEMOREX	1- 13	8 1/2	+1 1/8	+13.2
O	MICRODATA CORP	2- 10	9 3/8	- 3/4	-7.2
O	MODULAR COMPUTER SYS	3- 19	9	- 1/2	-3.2
N	NCR	13- 39	26 3/8	+2 7/8	+12.1
O	PRIME COMPUTER INC	2- 6	4 3/4	+ 3/4	+18.7
N	PERKIN-ELMER	16- 30	22 1/8	+1 3/4	+8.3
N	RAYTHEON CO	26- 39	46 1/2	+ 1/2	+1.0
N	SINGER COMPANY	9- 17	9 3/8	+ 1/8	+1.3
N	SPERRY RAND	26- 49	40 3/4	+1 1/2	+3.8
O	SYCOR INC	3- 22	20 3/4	+1 3/4	+9.2
A	SYSTEMS ENG. LABS	1- 7	6	0	0.0
N	VARIAN ASSOCIATES	7- 18	13	+1	+8.3
N	WANG LABS.	7- 17	11 3/8	+1 3/8	+16.6
N	XEROX CORP	47- 86	32 3/4	+1 7/8	+3.6

LEASING COMPANIES

EXCH		PRICE 1975-76 RANGE (1)	CLOSE JAN 7 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	1- 3	3 3/8	- 1/8	-3.3
A	COMMERCE GROUP CORP	2- 4	2 3/8	+ 1/8	+5.3
A	COMPUTER INVSTRS GRP	1- 2	3/4	+ 1/8	+20.0
N	DATRONIC RENTAL	1- 1	1/4	0	0.0
A	DCL INC	0- 1	3/8	+	+19.8
N	DPF INC	3- 6	3	+ 3/8	+8.1
O	EDP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 3	4 1/2	0	0.0
A	GREYHOUND COMPUTER	2- 3	3	+ 1/8	+4.3
N	ITEL	3- 9	6 1/2	+ 3/8	+10.6
N	LEASCO CORP	4- 8	6 7/8	+ 5/8	+10.0
O	LEASPAC CORP	1- 1	1/4	- 1/8	-33.3
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	MPG INC	0- 4	3/8	0	0.0
A	PIONEER TEX CORP	2- 7	6 3/8	+ 3/4	+12.7
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	7 1/2	+ 1/4	+ 3.4

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE MID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		PRICE 1975-76 RANGE (1)	CLOSE JAN 7 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 1	3/4	0	0.0
A	APPLIED DATA RES.	1- 10	1 3/8	+ 1/4	+18.1
N	AUTOMATIC DATA PROC	29- 63	38 3/8	+4 3/8	+8.1
O	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
O	COMPUTER DIMENSIONS	2- 6	2 3/8	+ 1/8	+3.9
O	COMP ELECTION SYSTMS	3- 7	3 1/2	- 1/4	-4.3
O	COMPUTER HORIZONS	1- 1	1/2	+ 1/8	+33.3
O	COMPUTER NETWORK	1- 3	2 1/2	+ 3/4	+42.8
N	COMPUTER SCIENCES	2- 6	4 1/4	+ 1/4	+6.2
O	COMPUTER TASK GROUP	1- 1	3/4	0	0.0
O	COMPUTER USAGE	2- 4	3 1/8	- 1/8	-3.8
O	COMSHARE	2- 4	2 1/8	+ 1/4	+13.3
O	DATATAB	1- 2	1	0	0.0
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	11- 28	13 7/8	+1 1/2	+12.1
O	INFORMATIONAL INC	1- 1	1/4	0	0.0
O	IPS COMPUTER MARKET.	1- 1	3/8	0	0.0
O	KEANE ASSOCIATES	2- 3	2 1/4	- 1/4	-10.0
O	KEYDATA CORP	2- 4	2 7/8	0	0.0
O	LOGICON	3- 3	3 7/8	+ 1/2	+14.8
A	MANAGEMENT DATA	1- 3	1 3/4	0	0.0
A	NATIONAL CSS INC	6- 14	13 7/8	+1 3/4	+14.4
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 17	13	- 1/2	-3.2
N	PLANNING RESEARCH	2- 6	3 3/8	+ 3/8	+12.3
O	PROGRAMMING & SYS	1- 1	1/2	0	0.0
O	RAPIDATA INC	2- 3	3 1/2	- 1/8	-3.4
O	REYNOLDS & REYNOLDS	10- 24	13 3/4	+ 1/2	+3.7
O	SCIENTIFIC COMPUTERS	1- 1	5/8	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1 1/8	0	0.0
O	TYMSHARE INC	7- 21	21 3/8	+3	+16.3
A	UPS SYSTEMS	2- 4	2 7/8	0	0.0
N	WYLY CORP	2- 4	2 3/8	+ 1/8	+3.0

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1975-76 RANGE (1)	CLOSE JAN 7 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	4- 9	8 1/4	+ 3/8	+4.7
O	ADVANCED MEMORY SYS	1- 7	4 3/4	+ 3/8	+8.3
N	AMPEX CORP	3- 7	5	0	0.0
O	ANDERSON JACOBSON	1- 3	1 7/8	+ 1/8	+7.1
O	BEEHIVE MEDICAL ELEC	1- 3	3 1/4	+ 1/8	+4.0
A	BOLT,BERANEK & NEW	5- 13	7 3/8	+ 3/4	+11.3
N	BUNKER-RAMO	4- 8	5 1/8	+ 7/8	+20.5
A	CALCOMP	3- 7	4	+ 3/8	+10.3
O	CAMBRIDGE MEMORIES	1- 5	1 7/8	- 1/4	-11.7
N	CENTRONICS DATA COMP	7- 23	20 3/8	+ 3/4	+3.8
O	CODEX CORP	15- 38	24	-1 1/2	-5.8
O	COGNITRONICS	1- 2	3/4	+ 1/8	+20.0
O	COMPUTER COMMUN.	1- 2	7/8	+ 1/8	+16.6
O	COMPUTER CONSOLES	3- 7	4 1/2	+ 1/4	+5.8
A	COMPUTER EQUIPMENT	1- 2	1 1/2	+ 1/4	+20.0
O	COMPUTER MACHINERY	1- 2	1	+ 1/4	+33.3
O	COMPUTER TRANSCEIVER	1- 2	3/4	0	0.0
O	COMTEN	2- 5	3 7/8	+ 3/8	+10.7
N	CONRAC CORP	12- 30	23 1/4	0	0.0
O	DATA ACCESS SYSTEMS	1- 3	2	+ 1/6	+14.2
O	DATA 100	5- 16	7 1/2	+ 3/4	+11.1
A	DATA PRODUCTS CORP	2- 6	5	+ 3/8	+8.1
O	DATA TECHNOLOGY	1- 3	1 1/4	0	0.0
O	DATUM INC	1- 2	1	0	0.0
O	DECISION DATA COMPUT	2- 7	2 7/8	+ 1/8	+4.3
O	DELTA DATA SYSTEMS	1- 1	1/4	+ 1/8	+100.0
O	DI/AN CONTROLS	1- 1	1/2	0	0.0
N	ELECTRONIC M & M	1- 3	1 1/2	+ 3/8	+33.3
O	FABRI-TEK	1- 1	3/8	- 1/8	-16.6
O	GENERAL COMPUTER SYS	1- 2	2	- 1/4	-11.1
N	HAZELTINE CORP	3- 6	4	+ 3/4	+23.0
N	HARRIS CORP	18- 33	33 3/8	+1	+2.9
A	INCOTERM CORP	3- 12	9 1/8	+ 3/8	+4.2
O	INFOREX INC	2- 5	3 1/8	+ 1/8	+4.1
O	INFORMATION INTL INC	8- 14	10 3/4	+ 3/4	+7.3
A	LUNDY ELECTRONICS	3- 6	6	+1 3/4	+41.1
O	MANAGEMENT ASSIST	1- 1	7/8	0	0.0
A	MILGO ELECTRONICS	8- 24	16 3/4	+1	+6.3
N	MOHAWK DATA SCI	1- 3	3 1/4	+ 1/8	+4.0
O	OPTICAL SCANNING	1- 3	1 1/2	0	0.0
O	PENRIL CORP	1- 2	1 1/4	0	0.0
O	PERTEC CORP	2- 8	3 3/4	+ 3/8	+20.0
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	1/4	- 1/8	-33.3
O	QUANTOR CORP	2- 6	4	0	0.0
O	RECOGNITION EQUIP	2- 9	3 7/8	- 1/8	-2.0
N	SANDERS ASSOCIATES	3- 11	7 1/4	+1	+16.0
O	SCAN DATA	1- 3	2 3/8	+ 1/4	+10.3
O	STORAGE TECHNOLOGY	6- 17	11 1/4	+ 3/4	+7.1
O	T BAR INC	3- 6	3 3/4	- 1/8	-2.1
O	TALLY CORP.	1- 5	4	+ 3/8	+10.3
O	TEC INC	1- 4	2 1/2	0	0.0
N	TEKTRONIX INC	18- 49	49	+4 1/8	+9.1
N	TELEX	1- 3	2 3/8	+ 3/8	+18.7
O	WANGCO INC	4- 12	11 3/4	+ 3/4	+6.8
O	WILTEK INC	1- 4	1 1/2	0	0.0

SUPPLIES & ACCESSORIES

EXCH		PRICE 1975-76 RANGE (1)	CLOSE JAN 7 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	BALTIMORE BUS FORMS	4- 5	4 1/2	+ 1/4	+3.8
A	BARRY WRIGHT	3- 7	5 7/8	+ 1/4	+4.4
O	CYBERMATICS INC	0- 1	3/8	+ 1/8	+30.0
A	DATA DOCUMENTS	29- 42	33 7/8	+ 3/4	+2.2
O	DUPLEX PRODUCTS INC	12- 25	20 1/8	+1 7/8	+10.2
N	ENNIS BUS. FORMS	5- 7	6	+ 1/2	+9.0
O	GRAHAM MAGNETICS	5- 10	9	+ 1/4	+2.8
O	GRAPHIC CONTROLS	8- 21	13	+ 1/2	+4.0
N	3M COMPANY	43- 68	58	+2 1/2	+4.3
O	MOORE CORP LTD	39- 51	47 1/2	+ 3/4	+1.6
N	NASHUA CORP	9- 22	11 1/2	+ 3/8	+3.3
O	STANDARD REGISTER	11- 20	16 1/4	+ 1/4	+1.5
O	TAB PRODUCTS CO	4- 8	5 1/2	+1	+22.2
N	UARCO	17- 24	21 3/4	+1	+4.8
O	VANIER GRAPHICS CORP	4- 7	3	+ 1/4	+3.2
A	WABASH MAGNETICS	3- 5	4 3/8	+ 3/8	+9.3
N	WALLACE BUS FORMS	15- 23	19 1/8	+ 1/4	+1.3

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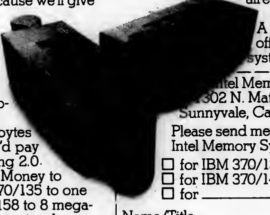

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